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operating system	Microsoft® Windows® XP Home Edition	Microsoft® Windows® XP Home Edition	**Microsoft® Windows® XP Home Edition**
memory	**NDW with 512MB Shared DDR SDRAM** (Up to 64MB of system memory may be allocated to support system graphics)	**NDW with 1024MB Shared DDR SDRAM** (Up to 64MB of system memory may be allocated to support system graphics)	**NOW with 1024MB DDR SDRAM**
hard drive	40GB[1] Hard Drive	40GB[1] Hard Drive	40GB[1] Hard Drive
graphics card	Integrated Graphics	Integrated Graphics	64MB DDR nVidia® GeForce™ FX Go 5200 Graphics
optical drive	**24X Max CD-RW/DVD[1] Combo Drive (Burn CDs and watch DVDs)**	**DVD+RW® Combo Drive (Burn/play DVDs and CDs)**	**24X Max CD-RW/DVD[1] Combo Drive (Burn CDs and watch DVDs)**
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operating system	Microsoft® Windows® XP Home Edition	**Microsoft® Windows® XP Home Edition**	**Microsoft® Windows® XP Home Edition**	**Microsoft® Windows® XP Home Edition**
memory	**NDW with 512MB Shared DDR SDRAM** (Between 32MB and 64MB of system memory may be allocated to support system graphics)	**NDW with 512MB Shared DDR SDRAM at 400MHz** (Between 32MB and 64MB of system memory may be allocated to support system graphics)	**NDW with 1024MB DDR SDRAM at 533MHz**	**NDW with 1024MB DDR SDRAM at 533MHz**
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graphics	Integrated Graphics	Integrated Graphics	128MB DDR ATI Radeon™ X300 Graphics	128MB DDR ATI™ Radeon™ X300 Graphics
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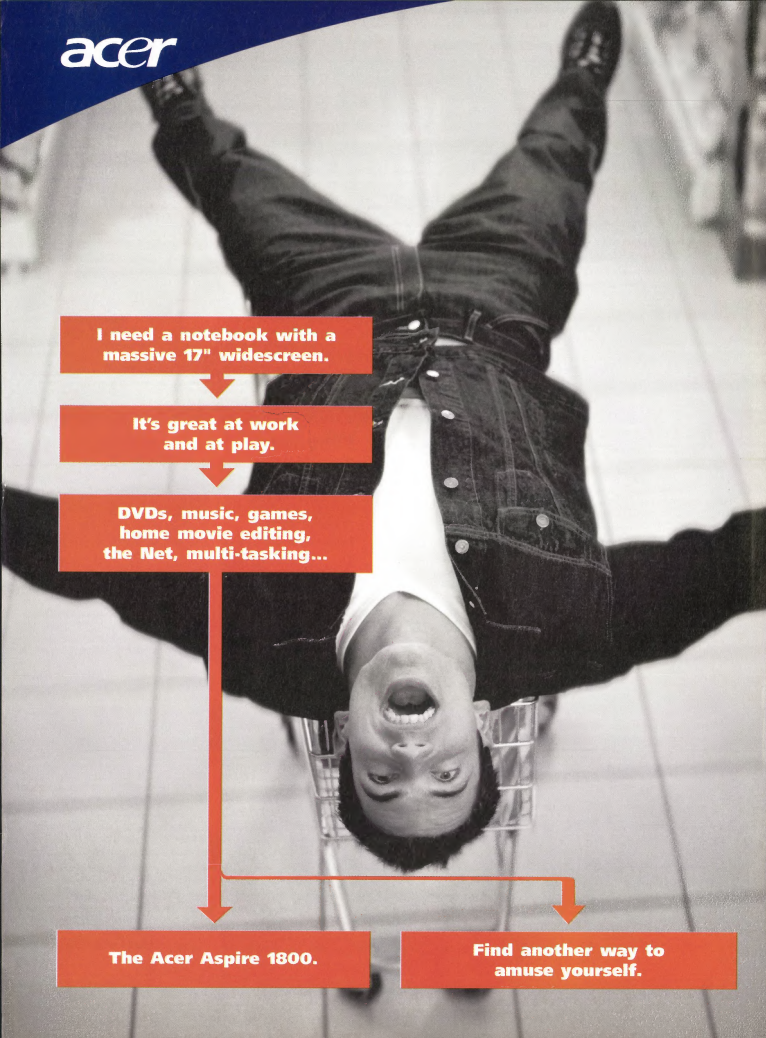
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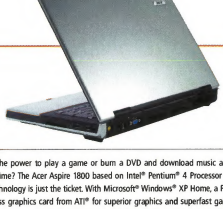

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And if you don't have a DVD burner that can write to DVD+R/RW media, now is the time to get one. Turn to page 92 for eight reviews of the latest DVD burners, and page 94 for the five of the best authoring applications.

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DVD POWER KIT

This month we've crammed in firmware updates for over 80 different models of DVD burners available in Australia. Also included are freeware and trial applications for analysing drives and media, converting DVD-Video, patching your drive and burning DVDs.

- **DVD Genie 4.10**
- **Nero InfoTool 2.21**
- **VirtualDub 1.5.10**
- **Nero 6 Demo**
- **DeepBurner 1.1.1.128**
- **XMPEG 5.03**
- **DVDINFOPro Freeware 2.60**

UltraISO 6.1

UltraISO is a CD/DVD image file creation, editing and conversion tool that allows you to directly edit an image file. Apart from the ability to extract files and folders from image files, it can also build new image files from your CD/DVD and maintain bootable files or information on your hard disk.

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WINner Tweak 1.4.0

Tweak, optimise and tune your installation of Windows 2000 Professional or XP with WINner Tweak. This month, we've included an exclusive special build of WINner Tweak 1.4 that will never time out. Upgrade to WINner TweakSE-2 2.6.6 and receive a 30% discount off the RRP. This offer is available exclusively to *APC* readers.

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- Monitor your security status with the **Windows Security Center**

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Workshop

DJ software

DJPlay 0.2.0 • MixVibes 5 Free • MixVibes 5 Pro • Tracktor DJ Studio 2.5.3 (Mac) • Tracktor DJ Studio 2.5.3 (Windows) • Virtual DJ Mk III

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Our cover disc extravaganza this issue celebrates two major milestones: Microsoft's awakening to the reality of the Internet with XP Service Pack 2, and the liberation of the hard disk by DVD burners.

Windows XP Service Pack 2 is a big deal because Microsoft has struggled to match its software to the Net. When the Internet first arrived, Microsoft decided not to cooperate, but to compete with an atrocity then called MSN (seen as On Australia here, and not to be confused with the existing Web-based service). I still remember the original MSN interface, in which you clicked on a hyperlink and the document would fire up in Word rather than a browser! Back then, the Net was just a competitor, like Apple's e-World (remember that one?).

With Windows XP and later versions of Internet Explorer, Microsoft finally began taking Web integration seriously — except it vastly underestimated the security issue.

The company planned to introduce the fixes in the next version of Windows, but decided to bring these forward into XP when it realised it needed more protection against Slammer worm-type attacks. So SP2 is really a Longhorn feature set delivered ahead of time. There's 475MB of Service Pack 2, which makes it a seriously large download for those on dialup connections (or $29.95 broadband plans). To save you the hassle, we've put it on a CD. The patch will install just like a regular software package.

The blank DVD+R on our cover disc set is our way of saying it's time to liberate your hard disks. Average hard drive capacities are simply not keeping up with storage needs brought on by the arrival of video on the desktop. Drives in new machines now range from 120GB to 180GB — but even that won't take long to fill.

One theory on what's driving the rush to DVD burners is that everyone is copying commercial movies and that this is the biggest illegal mass movement since people started using peer-to-peer networks to download music. But DVD burners answer a much simpler, more fundamental need: the desire to free up hard drives without having to spend all weekend burning their contents onto 200 CD-ROMs, or having to purchase specialised backup hardware.

A lot of us want the infinite hard disk — the ability to store thousands of applications, hundreds of hours of video and multiple operating systems, and access them simultaneously. Video is the main space hog, but it's not just home movies or copied commercial movies — it's becoming an important part of business and marketing communications. I see it increasingly in PowerPoint presentations, Web sites and even on monitors in shop windows. We are becoming a nation of movie producers and the internal storage hardware of our PCs is not keeping up.

With the arrival of DVD burners, I can now store around one hour of raw digital video on a couple of DVDs (or one Double Layer DVD). After editing, I can save the movie in a format that's playable on ordinary DVD drives or standalone players. Previously, I gave people CDs with WMA or MPEG files to be played on computers. Now I just burn videos onto DVDs and they can be watched in any home or boardroom with a DVD player attached to a TV.

The free blank DVD+R comes courtesy of NaSa Multimedia Technology, an enterprising local company which is becoming one of the major players in the CD and DVD media market.

DVD burners answer a fundamental need: they free up hard drive space

I mention the company in my editorial because NaSa has actually put its money where its mouth is by letting *APC* readers sample its blank LASER-branded DVDs, which normally retail for a few dollars each. Typically, I get accosted by companies wanting free editorial promotion in exchange for a giving away a couple of boxes of software, so I'm very pleased that NaSa is delivering some real value to *APC* readers.

Since there is a grab bag of write once and rewriteable DVD formats, it's always a good idea to look for upgrades to your DVD burner which may make it more compatible with a wider range of media. You can do this with firmware upgrades released by the DVD manufacturers. We've collected 87 upgrades and put them all on this month's cover CD — we even show you how to install them on page 84.

For the really adventurous, we also explain how to speed up your DVD burners (also on page 84). This isn't rocket science, but things can go wrong during the upgrade process, so a word of warning: if anything goes seriously awry you will probably void your DVD drive's warranty. But we know some of you like to push the boundaries, so we'll show you how to do it — we're assuming that as power users, you occasionally like to take these risks.

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Need to Know

News, views and analysis from the IT world

Who can stop the music?

IPod users are being reassured about music copying, but in reality, laws are getting tougher. *Dan Warne* reports.

One-off copies of music CDs for playback on your PC or portable MP3 player won't land you in jail, but don't even think about copying that commercial DVD. That's the mixed message consumers could be hearing as tougher US copyright laws collide with local debate.

Despite efforts to allay fears over digital music copies for use on iPods, the introduction of new restrictions looks like complicating issues anyway. Under new anti-copyright circumvention provisions outlined in Australia's Free Trade Agreement (FTA) with the US, both the distribution and use of any technology that gets around copy protection will be illegal in Australia. This refers to the anti-copying technology found on some music CDs, as well as the encryption on commercial DVDs.

The trade pact also makes it illegal to strip digital rights management information from a song purchased from BigPond Music in WMA format and then convert it to MP3 or AAC format for use on an iPod, for instance. Previously it was only an offence to supply or install tools for circumventing copy-protection technology.

Linux advocacy groups are alarmed that open source DVD players will become illegal, and Xbox and PlayStation modders who have been generally supported by the Australian Government until now will lose the right to modify the hardware they own.

But while FTA changes will outlaw copyright circumvention, the message from the local music industry over personal copying is more reassuring. "[Journalists ask] whether the copying of music to play in the car or at a party is what the industry is seeking to stamp out, but of course, that is not our main concern," said Stephen Peach, head of the Australian Recording Industry Association (ARIA).

Peach said the industry was working on new copy control initiatives that would permit music buyers to make a limited number of copies of music they purchase, allowing them to listen to music "in a variety of ways without saying, 'Just go for it, copy as much as you like'."

Consumers overseas are having success with the "fair use" argument

However, he fell short of advocating a change in the law to accommodate personal copies for use in iPods and other devices, saying mass copying would then become a "free-for-all".

"I don't hear people clamouring for a change in the jaywalking laws, simply because no-one gets charged for breaking them any more," Peach argued. "In 40 years of home taping, we've never sued anyone for making a music tape for their car."

But others argue that the issue is far from resolved and call for a change in laws to cover personal copying of music CDs for playback on MP3 players.

Anne Flahvin, copyright adviser for US law firm Baker & McKenzie, recently told a Sydney symposium there is a "glaring" difference between Australia and the US on personal copying and said it was "concerning" that the FTA made little effort to resolve this. "In an age where every second teenager — and lawyer — sports an MP3 player, the law is looking increasingly ridiculous," she concluded.

Australian law only permits the reproduction of copyright material when it's predominantly for study or review purposes. A parliamentary report ▶

***Copy confusion:** some argue digital music copying is still a legal grey area.*

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Dial 0 for virus scan

As if the problem of viruses on PCs wasn't bad enough, mobile phone users are now also facing the prospect of downloading and updating antivirus software.

In the wake of the widely-reported Cabir virus, said to be the first type to target mobile phones, virus scanners for phones have begun to appear. Symantec, McAfee and Fsecure are among the established firms working on products.

***APC* spoke to Simon Crean, the managing director of Australian company Jamanda, which not only has antivirus software for Nokia phones in the works, but also antispam, backup and a phone firewall.**

"We've been waiting to raise money for a year, and the first question [from potential investors] was always, 'Are there any viruses out there?'," said an excited Crean during the post-Cabir frenzy. At least someone's happy.

William Maher

Hardware

The real power game

Are speeds for new PCI Express boards all they're cracked up to be?

Power-hungry PC owners considering new PCI Express motherboards would do well to check the fine print — beneath the long lists of onboard features like super-fast networking and multiple hard drive arrays lies a considerable catch.

Rather than actually eliminating speed bottlenecks, some of the new PCI Express boards tested by *APC*'s Labs team have succeeded in adding new ones. Depending on the devices attached to the board and the amount of bus time they use, peripheral performance may be no better than using a previous generation board.

A good example is Gigabyte's GA-8ANXP-D, though the problem applies to some boards from ASUS and other i915 or i925 boards. While the Gigabyte's feature list looks impressive — two Gigabit LAN ports, eight USB 2.0 ports, two FireWire 800 ports and eight Serial ATA ports — only one of the Gigabit Ethernet adaptors is on a PCI Express interface. While this adaptor might operate at top speed, the other onboard ports will be throttled back through the slower 133MB/s PCI bus. So much for blazing speeds.

The bottleneck is caused by manufacturers adding too many onboard features. Both i915 and i925 boards have a maximum of 20 PCI Express lanes available, of which 16 are used for graphics, leaving a maximum of four for other peripherals. The problem is that boards such as the Gigabyte have reserved three of these lanes for PCI Express x1 slots for external plug-in devices, leaving room for just one onboard PCIe controller. The remaining onboard features, from FireWire ports to hard drive arrays, then run through the slower PCI bus.

Bottlenecked: *traffic on PCI Express boards can still snarl up.*

This doesn't mean new boards will run any slower than the older technology. But if people are expecting PCI bottlenecks to disappear, they'll be mistaken unless they choose their boards carefully. It's a lesson in what can happen when marketing hype overrides commonsense engineering.

William Maher and Jarrod Spiga

▶ Who can stop the music?

previously recommended bringing this into line with the US policy of "fair use".

Australian Democrats IT spokesman Senator Brian Greig supports this view. "I'm not advocating that you should be able to buy an original of something and then mass-produce copies," he said. "But it seems peculiar that if somebody buys a CD and then puts it on their iPod for their own use that should infringe copyright."

Meanwhile, consumers overseas are having success with the "fair use" argument. As a result, Hollywood is piloting a new DVD specification that will allow consumers to make a limited number of legal copies, and the US Federal Communications Commission has approved the right of owners of TIVO personal video recorders to share TV recordings over the Net with up to nine others.

Both technologies are designed to stem the flow of what the industry has labelled "indiscriminate copying" over the Internet. They give consumers easy-to-use technology for copying with built-in limitations which they hope will become more popular than the relatively difficult methods currently used by movie pirates.

But Music Industry Piracy Investigation head Michael Speck said Australian consumers shouldn't expect the legal right to rip CDs they own into iTunes anytime soon.

"If you want to buy music and make a series of copies, you can do that. What you do is go to a legal download music site and you buy it. The argument [that intellectual property laws will have to change to accommodate CD copying] is specious. It's driven by people who don't pay for the property and are running businesses based on breaching copyright, who rely on the fact that the consumer won't undertake the grand analysis of the difference in products.

"If you buy a CD, you buy a physical product that allows you to listen to the music contained thereon," Speck continued. "If you buy a legitimate download, you buy the right to download that music and store it in a music player and in some cases make a limited number of copies to approved formats."

Your new MP3/DVD rights

- **No "fair use" right to make copies of CD/DVD for personal use, even if you own them.**
- **Illegal to distribute or use any copyright circumvention device. This includes watching DVDs on Linux or modifying an Xbox so that it can play games bought in other regions.**
- **Illegal to remove digital rights management information from a file.**

Information correct at time of writing.
Disclaimer: *this does not constitute legal advice. Check with the appropriate legal authorities if an issue specifically concerns you.*

Chat

Email, voice now linked

Combining voice, chat, email and instant messaging is now a reality. Soon, they could all be linked via one catch-all "Internet telephone number".

"Voice over IP is dead, get over it," is a strange comment coming from a man who makes his living from pushing next-generation telephony. But according to Mick Reagan, Nortel's chief convergence architect, the real future lies in all-in-one communications services, a concept that is poised to become reality in the near future.

Reagan is behind Australia's first commercial all-in-one communication service, designed to simplify the headache of keeping track of a flood of instant messages, voicemails and emails.

The Optus service, called IP Centrex, will "find" you wherever you are — on mobile phone, SIP PC soft-phone or even Instant Messenger. End users can set their "presence" in the software, stating how they would prefer to be contacted at any given time, and servers at Optus exchanges running Nortel software interact with your PC to direct your messages.

Optus' service is not cheap. At about $300 per end user per month, it will only appeal to small businesses wanting to avoid the cost of installing and maintaining a PABX and videoconferencing equipment. But similar, more advanced systems are already being planned for consumers.

The authorities that control the structure of the Internet are already working on implementing a universal address called "eNum", based on the e.164 Internet numbering standard. The concept is simple: each individual will have one number for all forms of communication, and the Internet's domain name servers (DNS) will switch through to the appropriate end-point depending on the method of communication being used. The tagline being used to describe the system is "Telephone number in, URL out".

It aims to do away with separate email addresses, phone numbers, SIP Voice over IP identifiers, Web site addresses and IM IDs — one eNum identifier will be used for all of them. The proposed eNum standard calls for the use of telephone numbers in reverse as these provide an existing worldwide index which has an internationally agreed numbering scheme.

An Australian taskforce has been appointed, led by the Australian Communications Authority, with the aim of bringing government, Internet authorities and telcos together to produce a one-size-fits-all communication system.

However, the system may be several years

Outlook calling: *all-in-one communication blurs the line between voice and real time messaging.*

away from going live because of policy issues that need to be worked out, said Australian Domain Authority CEO Chris Disspain. For instance, people might not want to disclose their phone number whenever they give out their email address. Then there's the problem of person-to-person communication using shared phone numbers.

Even without a formal eNum system in operation, developers are rapidly bolstering instant messaging clients with enhanced voice capabilities. PhoneGAIM runs on Linspire Linux, offering instant messaging, voice telephony using the SIP protocol, voicemail that allows others to leave you messages when you're not logged on, and the ability to call "real" telephones at a much lower cost than using a regular telco.

Dan Warne

Phone book of the future

Taste real time communications yourself by registering your phone number at e164.org (*www.e164.org*). People using compatible software (not common) will only need to remember one number, whether they're calling you on a landline phone, via Voice over IP, sending an email or adding you to their instant messenger list.

- Enthusiast version of eNum
  www.e164.org
- Australia's eNum trial
  www.aca.gov.au/telcomm/telephone_numbering/enum_nsg2/index.htm
- International eNum homepage
  www.itu.int/osg/spu/enum

Is it legal. . .

. . .to use Windows accelerators?

Creators of "accelerators" claim to actually be capable of boosting your PC's performance. A utility called Hare claims performance gains of 300%, though technical information is sketchy at best. The Web site claims Hare's features include an "88-bit kernel" for accelerating common system instructions, plus memory defragging and CPU tasking. Registry hacks are often used.

Microsoft says people should "leave the registry alone". But it stopped short of forbidding it outright, adding that anyone altering the registry should back up their system first. Don't say you weren't warned.

Disclaimer: *this does not constitute legal advice. Check with the appropriate legal authorities if an issue specifically concerns you.*

Next-gen wireless

It's called Adaptive Radio, and if Intel's vision proves to be accurate it may one day allow wireless users to forget about the confusing jumble of standards, speeds and encryption mechanisms.

Intel is reportedly planning radio chips that can skip between frequency bands, detecting and adjusting to available networks, rather than searching for one pre-programmed signal.

Eventually, it's hoped that wireless chips will connect across the plethora of different signals in the air. A laptop equipped with such technology could potentially connect over Wi-Fi in airport lounges, 3G networks in cities or the emerging WiMax standard over longer distances.

Underground MP3s

Services such as Kazaa may still be operating in the face of legal action, but elsewhere there are signs that file traders are returning to their underground roots.

P2P software developers are aggressively pushing ahead with moves to make people using their software more anonymous. Pablo Soto, developer of the P2P protocol that forms the basis of Blubster, Piolet and RockItNet, claims the latest version will mask users' identities.

"If other means of delivery could be compared to a postal system, with an identifiable sender and receiver, then Blubster's proprietary MP2P network could be likened to throwing a bottled message into the vast ocean," he said. "The message may get to a destination, but no-one knows the full path of its journey, nor what is in each bottle."

While the software puts significant roadblocks in the way of Investigators, Soto defends MP2P, saying it uses three separate layers of protection: true peer-to-peer transfer with no central servers, fully encrypted communication, and a mix of TCP and UDP communication to make monitoring a single data stream more difficult.

Other networks disguising users include Earthstation 5 and Filetopia. Methods include the use of proxy computers.

The trend follows a legal settlement between peer-to-peer service iMesh and record companies. IMesh said it is working on new technology that will enable users to "find and share content... without the fear of being sued."

Dan Warne

Data dump

30,000

Spam complaints to Australian authorities since local antispam laws came into effect in April. Don't hold your breath for action: only four warnings threatening punishment have been handed out so far, with most spammers located overseas.

Proposed US fine for setting up fake online bank sites $250,000	Money lost to phishing in the year to April US$1.2 billion

(Source: CDN)

Copies downloaded of iMesh music sharing software 76 million	Copyright payout made by iMesh owner to record companies US$4.1 million

(Source: CDN)

Number of Microsoft employees with online blogs in 2003 100	Number with blogs in 2004 800

(Source: BusinessWeek Online)

Proportion of IT workers with 9am to 5pm workdays 30%	Proportion who work overtime regularly 27%

(Source: survey by ICT recruitment company Candle, reported by CDN)

Exchange: Chris Disspain

Meet the man in the front line of the battle against domain name fraud.

Thousands of Australians have lost money to Internet domain name scams, particularly those who registered domains through Domain Names Australia (DNA). We put some of the most common complaints to Chris Disspain, CEO of the Australian Domain Name Authority (auDA).

What's the progress on getting money back for Domain Names Australia victims?
DNA has appealed to the full bench of the Federal Court. Our message remains firm: we are committed to getting a result from the court stating that DNA's behaviour isn't acceptable so we can proceed with a class action in order to get money back to consumers.

How can a domain registrar afford to fight a drawn out legal battle?
Very simply — 9,000 people paid them $237 for a domain name which in many cases hasn't been registered yet. There's an awful lot of cash there for a fighting fund.

What lessons have been learnt from the DNA saga?
The biggest lesson for us is that we need to educate small business and the public about auDA and the code of practice around domain name registrations.

AuDA isn't a government body — we can only "govern by contract". Unfortunately, DNA was just buying domains like any other person "walking in off the street" and then reselling them. It wasn't a contracted and accredited registrar.

Entities such as law firms, accountants and ISPs can legitimately manage domains on behalf of customers without necessarily being accredited — DNA is the only company we've had problems with. If it became a growing problem we would go back to government for a legislative solution.

Why do Australian domains cost so much when you can buy .com domains for about US$7?
Actually, Australian domains aren't that much more expensive than their .com equivalents. A

Software

Microsoft's hardware game plan

Microsoft looks to strengthen its influence on PC hardware makers.

If the latest plans of the self-proclaimed "worldwide leader in software" are any guide, Microsoft is working harder than ever to boost its links to hardware makers.

The company recently unveiled a plan to sell hardware directly from within Windows. Dubbed Windows Marketplace, the program will embed a link to a software and hardware sales site directly into the Windows XP Start button and Internet Explorer. Significantly, products which meet the requirements of Microsoft's "Designed for Windows" program will be separated from other products and given an extra promotional push.

In effect, Microsoft will use the incentive of extra sales to encourage hardware and software developers to follow its certification schemes. "The ability to identify products that have received the 'Designed for Windows' logo has been shown to have a positive effect on customers' intent to purchase," a message promoting the program noted.

Microhard?: *Bill Gates attempts to sharpen his focus on — and influence over — hardware manufacturers.*

A spokesperson told *APC* that Microsoft has no immediate plans to implement the Windows Marketplace scheme in Australia, so local users will just have to put up with the redundant links to the Marketplace site that will be embedded within the new software. However, if the model proves a useful source of revenue for Microsoft it is likely to hit these shores eventually.

The screws are tightening between PC makers and the operating system supplier. The need to control design in the console market led Microsoft more directly into hardware with the Xbox. More recently, Microsoft released Windows XP Media Center Edition in the US, which is bundled exclusively with specifically designed PCs from brands such as HP, Acer and Toshiba. One persistent rumour suggests that Microsoft will be applying even tighter certification rules for hardware passing the Windows Hardware Quality Labs (WHQL) process in Longhorn.

Microsoft's longstanding alliance with Intel has been hugely beneficial to both companies. However, Intel now has the advantage of an alternative operating system that's also optimised for its processors in the form of Linux, a factor which has changed the balance of power between the two companies. Working closely with other vendors will help Microsoft retain control over hardware elements, a model it is already successfully applying with Media Center PCs.

Microsoft's bundle-and-control approach has been the target of frequent criticism. But integration continues to bring benefits to consumers according to Brian Prentice, a senior analyst at META Group. "If nothing was ever rolled into the operating system we would still be buying word processors based on who had the best print drivers."

As Microsoft looks beyond Wintel, that influence will be stronger than ever.

Angus Kidman

Interview

.com name will probably cost you US$12 a year. That's roughly $18, or $36 for two years. In comparison, a .au domain name is $60 for two years with the cheapest registrar, so it's not a huge price difference in dollar terms.

Domain names in the .au space come with protections you don't get anywhere else in the world, and which are actually policed. If you go to a .com.au domain name, you can be assured it is owned by an Australian business or related to an Australian registered trademark. The chance of typing in "shares.com.au" and going to a porn site is negligible.

Who gets the money from a .com.au registration?

Let's take a median example — $90 for a two-year .com.au licence. Of that, $7.50 goes to us, $30 to the company that operates the registry, and the remainder ($52.50) to the registrar.

That still sounds like a lot of fat. Most people would find a $10 .com domain name pretty attractive for personal use compared to $60 for a .com.au domain.

People wouldn't be registering a .com.au domain for a personal use though, because they're for companies only. They would be registering an id.au domain, which is about $25 for two years if you shop around. There's not a lot of publicity about .id.au at the moment, but it's building.

Is the issue of companies snapping up expired domains a growing problem?

It's actually as difficult as it possibly can be for people to deliberately buy up expired domain names. We don't publish expired names, nor expiry dates, on individual domain records.

Shouldn't it be harder for people to forget to renew their domain?

It's crucial people realise it's their responsibility to renew their domain, just like their driver's licence. After email and postal reminders, domains go into a "pending delete" mode for two weeks where anything linked to the domain — a Web site and email server for example — will stop functioning. At the end of that, the domain name is randomly released into the pool over the next 21 days.

Chris Disspain spoke to Dan Warne

Quote file

"There's no doubt the prospect of Linux gave Microsoft a shake"

Telstra's Ted Pretty explains how the telco secured a discount from Microsoft for a massive new upgrade deal to its 40,000 PC network. If only everyone else could be so lucky.

(Source: *The Australian*)

OS wars

Code reboot for Linux

Can the Linux file system adapt to compete with Longhorn?

It sounds like the coding equivalent of a practical joke, but for some Linux advocates the "dancing tree" algorithm represents a possible basis for a future Longhorn-conquering file system.

The algorithm is the key to the Reiser4 file system, which its creators claim will enable the speedy management of millions of files. Some even argue that it could be used as the basis for an attribute-like system, a search concept behind both Longhorn and Apple's Tiger operating system.

Implementation details differ, but both Longhorn's WinFS file system and Tiger's Spotlight make navigating and searching for files easier by using a network of simple attribute pairs — such as creation date, file type or content keywords — assigned to each file. File systems move from their current simple flat file structure and take on a complex relational approach. It's a challenging developmental task, but one which offers much greater flexibility.

Pressure is now building from some areas within the Linux community for a similar file system, with some claiming Linux's future ability to compete is at stake. As Mark Stone put it in a commentary piece at Linux.com: "If Linux is really to compete on the desktop, and if it's to advance its hold in the server space, it must enter the search wars, and do so at the file system level."

Compared with current flavours of Windows, Linux can support a wide variety of existing external file systems (mostly derived from the Unix world). Despite that versatility, it doesn't offer a true attribute-driven system. That doesn't mean developers haven't already attacked the problem. Several projects exist which cross into file indexing and advanced searching, including the Gnome Storage project. A comparison of some of these can be found at **www.gnome.org/~seth/blog/document-indexing**.

However, making the issue a high priority is proving difficult for the open source community. At the recent LinuxWorld conference, protecting Linux from copyright and patent lawsuits such as that filed by SCO was still the most prominent talking point.

The argument that the battle might be better fought elsewhere, because technical superiority alone hasn't always assisted Linux, carries some weight. For instance, an Evans Data survey in July found that 92% of Linux developers have never been infected by a virus, but such data has made little difference to the uptake of Linux.

Angus Kidman

Back to basics: *is Linux ready for o Longhorn-like file system overhaul?*

File sharing

P2P music on your phone

File sharing software that's not only legal but can earn you money?

Walk down the street with a Bluetooth-enabled MP3 player and you could receive a text message that someone nearby shares your taste in music and would like to download a couple of your favourite tracks. Sounds far-fetched? Not any more. Melbourne company AgentArts (**www.agentarts.com**) is bringing music sharing to mobile devices.

Dubbed IcyPole, the "recommendation" software should be available for download by year's end. Better still, AgentArts is investigating payment methods and copy protection systems, so this P2P play has the potential to earn you a few cents every time you help record companies by distributing their tunes.

Simon Sharwood

MP3 on the go: *opening the doors for wireless P2P.*

GRAPHICS BY ATI RADEON

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The hard drive acid test

Hard drives can survive fire, drowning in beer and getting run over, but there are still ways of getting rid of data for good, as *Angus Kidman* discovers.

Inside info

- Recovery software
www.crocware.com
- Disk Investigator
www.theabsolute.net/sware/dskinv.html
- DIY DataRecovery
www.diydatarecovery.nl
- Magic Recover
www.software-recovery.com
- Winternals
www.winternals.com

If you're going to murder someone, it's not a good idea to do so while a Webcam is filming the incident. Faced with this problem, one killer took extreme steps to destroy the evidence. After prying the hard drive out of a notebook with a crowbar, said killer twisted the platters beyond recognition with pliers, then threw the drive in a swimming pool for good measure.

"I don't know why they didn't just take it with them and throw it in a bin," muses Brian Nestor from Precise Data Recovery Services (PDRS), who was sent the mangled drive by an Asian police force who wanted to know if the data could be recovered. The answer in this case was no, so the murderer's goal was accomplished. But it was a risky endeavour.

While we're accustomed to thinking of hard drives as fragile creatures, data recovery experts can retrieve data even in situations which would at first appear hopeless. PDRS successfully retrieved data from a notebook which had fallen into a bath while in use. "Who knows what he was doing with it in there," says Nestor with a laugh.

Non-disclosure agreements prevent Nestor discussing many of his more interesting cases, but he does mention one international military client that managed to drop a notebook out of a helicopter and onto a submarine. (The data was retrieved in that instance.)

Data recovery companies can handle a range of situations with aplomb (see "Would your drive survive this?"). Yet most drive failures, and the consequent risk of data loss, are for more mundane reasons. "The most common scenario is that the hard drive PCB is blown by a power surge," says Guy Riddle, manager of the Sydney office of CBL Data Recovery.

"The second most common is that the internal workings of the drive go wrong," he

Would your drive survive this?

We asked recovery experts *Guy Riddle* and *Brian Nestor* for their assessment of four extreme scenarios.

FIRE

Recovering data from a drive that's been in a fire is straightforward, if painstaking. "Very rarely would a fire be so bad that the platters are damaged beyond repair," says Nestor.

"It depends on how long the machine has been exposed and what temperature it has got to," says Riddle. "If it's got so hot that it's melted everything, there's not much you can do. Generally, we rebuild one drive from another drive. It's not uncommon for us to have to vandalise another drive to get the head assembly working again."

WATER

"Drives are pretty resilient, but they're not completely waterproof," says Riddle. "We have to disassemble the drive and use a special high-quality cleaning fluid to remove any residue. When we reassemble it, we have to ensure the read-write heads don't come in contact with any particles."

"It's not problematic, provided the client doesn't start up the drive," says Nestor. When asked to fix 34 drives which had been subject to flooding in Katherine, NT, the only drive PDRS was unable to fix was one the user had opened before sending it in.

CRUSHING AND FALLING

Nestor and Riddle agree: "If the platters are intact, we should be able to recover the data."

"We occasionally get notebooks that have been knocked off the table," says Riddle. "When they hit the floor, the read-write head will either scratch or chip away a piece of the magnetic coating. That requires a bit of work."

INDUSTRIAL MAGNETS

For total data destruction, it's hard to beat magnetic fields. "A strong enough magnetic field around the drive can make it impossible to recover the data," says Riddle.

Fortunately, magnetic fields of that strength are uncommon outside the specialised degaussing machines employed by data destruction professionals. "I don't think there are enough of these machines for common usage," says Nestor.

continues. "In either scenario, you can't use conventional recovery tools or software."

Physical damage isn't the only potential hazard of storing data on hard drives. Personal data can also be readily retrieved from junked machines. Software designed to help users recover data deleted through accidents or malicious code can also be deployed to locate information on stolen or second-hand PCs. For instance, two students bought 158 pre-owned drives on eBay in 2003 and uncovered personal information on 28 of them.

Mind you, this sort of behaviour — and even some relatively mundane activities — can put you on the wrong side of privacy laws. Nestor points out that, in theory, no drive containing personal information can be sent overseas, even for warranty repairs because to do so would violate national privacy principles concerning cross-border transport of data.

THE CONCEALED OS

So, if throwing a drive from a helicopter can't effectively get rid of personal data, what can be done to effectively erase it? Specialist software packages provide one possible solution (see "Is your data really gone?"). However, to ensure that data remains as confidential as possible both while you're using it and when you decide to get rid of it, changes are required at the operating system level.

Different operating systems vary in how readily they allow you to dispose of data by overwriting it with new information. Unix comes up looking good in this picture. "If you purposely erase something, Unix makes the space available for immediate rewriting," says Nestor. "Windows is more random."

Unix is also being used as the basis for "anti-forensic" file system approaches, which are designed to be more resistant to probing by curious parties. In a series of presentations across the world, a hacker known as "grugg" outlined three core principles for working with data in a way that makes it hard to trace.

The first of these is data destruction, which involves deleting and overwriting data as soon as it is no longer useful. Then there's data hiding — storing data in formats and locations that aren't obvious, as well as using encryption techniques. Lastly, data contraception means keeping data in memory as much as possible and only accessing it with standard tools, making its presence less obvious.

These approaches are undoubtedly overkill for most individual users, but could prove useful to large corporations more concerned with maintaining privacy than audit trails, as well as appealing to the hacker community.

Despite such advances, safeguarding our personal data is likely to remain a problem as long as we maintain the same sort of lackadaisical attitude to deleting unwanted data as we do to backing information up. As Riddle points out: "People are just as slack as they have always been." APC

Is your data really gone?

You don't need to be criminally-minded to want to completely erase your hard drive. Anyone hoping to sell or redeploy an existing drive is advised to wipe existing data, but what methods are available?

Formatting a drive is of little practical use, since existing data won't be removed until new information is written over it. A low-level format, which replaces the manufacturing information on sector layout, makes it harder to track down old data, but the only way to ensure that data is permanently erased is to overwrite every sector multiple times with random data. Tools which can help accomplish that task include DBAN (**http://dban.sourceforge.net**), available as an open source product, and commercial tools such as R-Wipe (**www.r-wipe.com**) or SecureClean (**www.whitecanyon.com**).

Such an approach is only worthwhile if you do it thoroughly. "Most of those programs only do so many bytes and leave the rest," says Nestor. "Nobody wants to take the 12 hours needed to do a 60GB drive."

To completely erase data, you could also get a specialist to place the drive in a degaussing unit and completely magnetise it — a speedier but more costly alternative.

Michael Speck

DVD's burning question

Don't hate the copyright police — they're not out to get iPod users. But that doesn't mean they support a tax on blank media.

Imagine a world where car thieves develop or adopt a new technology that allows them to steal a car whenever they want. What do you think is the last thing car owners, car manufacturers and governments are going to do? Even with the most economical application of commonsense they won't be creating a new tax on cars to accommodate this phenomenon.

However, if copyright is being stolen or misappropriated — that is, digital music via the Internet — the prospect of a tax to compensate the victims rather than fixing the problem is passed off as plausible.

Proponents of the so-called "blank media levy" rely on variations of three propositions to justify its imposition, but they all boil down to the idea that private copying of music is out of control and uncontrollable, and therefore some money should be made from it.

This ought to offend anyone with an interest in technology or intellectual property rights. If you're inclined to accept this proposition, you have to ignore a great deal of information and not question much of what the levy's proponents offer up by way of explanation.

CHANGING FACE OF PIRACY

To suggest that the exchange of music on the Internet or private copying is out of control is preposterous. Granted, the music industry has had to struggle to compete with pirate operations in the online environment, but with the emergence of legitimate online music services this is clearly changing. If the terror of online anarchy doesn't convince, then you are told that technology will never control online piracy or private copying. This only works if you have no faith in the technology and you can overlook the amount of control needed to pursue or administer the levy.

Of course, with the fear argument comes a dose of loathing because you'll very quickly be told that you can be prosecuted for private copying. Ignoring the obvious fact that the person or organisation telling you this has nothing to do with the copyright owner and therefore cannot make this statement with any credibility, I can assure you, as the head of the Australian Recording Industry Association's (ARIA) anti-piracy unit for the past decade, that no-one gets prosecuted for private copying — as a rule we only prosecute infringers whose activities are significant.

Finally, proponents of a levy suggest it offers some compensation to copyright owners. Well, those copyright owners would rather make money from the sale of their products than accept a smaller amount from the theft of them. In fact, it's impossible to think of a business that would prefer this sort of arrangement!

What you are not told here is that a levy means additional costs to consumers and not cheaper products. Further, a wide variety of blank media products are not used for storing music or other forms of entertainment.

We live in a world and engage an online environment where technology moves so fast that people suffer acronym fatigue. Perhaps the solution for illicit online activity is the next generation of compression technology, User Datagram Protocol, Transmission Control Protocol or some hybrid of all three — we can only wait and see.

That solution won't come from any legislation or impost that legitimises the illicit activity or obscures the difference between legitimate and illegal activity. Blank media taxes and other legitimising activities that online pirates rely on to generate their revenues, such as private copying, shouldn't be part of the legislative framework in the digital age as they can't properly encourage its evolution.

Michael Speck is general manager of Music Piracy Investigations (MIPI), which has been involved in anti-piracy investigations of Kazaa.

Mary Jo Foley

Bloggers "R" Microsoft?

No wonder there's a blogging frenzy at Microsoft — the software giant has a history of missing street buzz about new tech.

Windows Watch

Over the past couple of years, the number of Microsoft employees who are also bloggers has jumped from just a handful to more than 1,000. And according to my sources, word is that chairman Gates is sharpening his virtual pencil in preparation to become chief blogging architect.

This blogging wave is washing over the company just in the nick of time. Until fairly recently, Microsoft — in spite of being the world's largest software company — has been lagging behind major technology trends.

In the past — in search, gaming and the Internet, to name but three examples — it took an 11th-hour call to action by a persistent (and fearless) Microsoft techno-watcher to convince the company's top brass that it was about to miss the boat. Only then did Gates and/or CEO Steve Ballmer issue a major course correction. (Remember Gates's "Internet Tidal Wave" memo in the mid-1990s, anyone?)

Microsoft has always been a company run from the top down, and the cults of Bill G and Steve B are quite strong. Relatively few employees were willing to rock the corporate boat, even in the name of doing the right thing by its customers and partners.

But more recently, Microsoft's leadership has come to acknowledge that the company is out of touch with its customer and partner constituencies. In spite of valiant and often somewhat successful programs such as the Microsoft Developer Network (MSDN), the company's been accused by many developers, OEMs, resellers and customers of being arrogant, uncaring and unapproachable.

To remedy the situation, executives have been desperately seeking new ways to reach out to these disenfranchised groups. Blogs are ideal in this respect because they provide an unparalleled level of transparency and interactivity. Do you want to know what your customers and partners want? Simply ask them and they'll reply, early and often, via the comment section on your blog.

This Microsoft blogging phenomenon is no fad, and that's downright astounding. And it just might end up pulling Microsoft's head out of the sand.

*As Editor of Microsoft Watch (**www.microsoftwatch.com**), Mary Jo Foley is one of the world's most prominent longtime Microsoft pundits, covering the software giant since the early 1980s. Each month Foley sounds off exclusively for* APC *on Longhorn and more.*

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*Second battery is optional. Illustrated screen image.

Why Microsoft is still a monopoly

Ziggy Malter, I'm absolutely flabbergasted at your black and white views and lack of research (*APC* August, page 31). You don't need to have the full 100% market share to be a monopoly.

Microsoft Windows runs on approximately 90% of desktop machines. Of the remaining 10%, Apple take up less than 5% of the market and the rest is a mix of other operating systems, including countless versions of Linux.

There is only one company that controls most of the market and it is regularly shown that companies do whatever Microsoft wants because they need to get their product to 90% of users to make the most money.

The reason Microsoft would have to give up some of its code is because its dominance in the market, or monopoly, means that rival companies have no ability to fairly compete against it. Just take a look at what was going on before governments around the world started taking action against Microsoft [for anti-competitive practices]. Windows *had* to be shipped with machines exclusively, meaning people *couldn't* get a machine installed with another OS at purchase time.

Most users don't understand what an OS is or what the alternatives are, so they certainly won't be asking for Mandrake pre-installed. Internet Explorer used to be, and in reality still is, totally integrated into the OS. Other browsers were unable to utilise a lot of the features that Microsoft had added in the way of OS/browser integration because it was using application programming interfaces only Microsoft knew about.

As for Ziggy Malter's assertion that Apple has a proprietary product and forces its users to use its operating system, take a closer look. Apple is running a Unix-based operating system. Its underpinnings, Darwin, are freely available to the open source community. Apple contributes vastly to projects such as the KHTML Web rendering engine which is used in Safari, with all of that input given back to the KHTML developer/user community.

Many times I have compiled source code written on a PC Linux machine on a Mac OS X box, and the other way around, but you can't take source code written for Windows and compile it on another platform. Why is that?

Adam Rice
Red Hill, Qld

Go directly to jail: *do not collect $2 billion.*

NO MIRACLE VACCINE

Richard Leahy's suggestion that ISPs should be made responsible for virus control (*APC* August, page 30) is ridiculous!

We are a small, rural ISP with approximately 1,400 customers. Since the day we opened we have absorbed the $3,000 annual cost of running virus-checking software on our mail server. Simultaneously, our monthly data costs have been rising constantly due to virus and

Letter of the month

MODEMS OF THE FUTURE

I bought an internal 56K modem, an internal ADSL modem and an internal TV tuner card, each of which was reputed to work under both Linux and FreeBSD using open source drivers. Three devices and two OSes made six combinations. My success rate: 0 out of 6. So I got to thinking.

It's easy to set up an external 56K serial modem under Linux because it doesn't need a driver, only the PPP configuration files (see the iiNet support page at **www.linet.net.au/support/linux/index.html**).

An internal modem would behave similarly if it worked through an on-card serial port. Indeed, such modems were manufactured until quite recently. But they seem to have been discontinued.

Likewise, an external ADSL Ethernet modem needs no driver. In fact, if it also includes built-in PPPoE/PPPoA clients and a DHCP server, it needs no modem-related software at all: you point your browser at the local IP address of the modem, fill in the form, save it, reboot the modem, and thereafter it just works.

So I reasoned that an internal ADSL modem interfaced through an on-card Ethernet port would likewise work without a driver under any OS. It could even be cabled to an LED panel mounted in a spare drive slot for maximum visibility. But apparently nobody makes such a modem.

As for the TV tuner card, I can't help noticing that a PATA or SATA DVD-ROM drive plays DVD videos under multiple operating systems using standard multimedia software. As a result, a TV tuner will work with multiple operating systems if it connects to an IDE port and emulates a DVD-ROM drive. If it also occupies a drive bay, it will be ideally located for remote control. But, once again, it seems that nobody makes such a tuner.

On balance, these "IDE TV tuners" and "PCI Ethernet modems" could be price-competitive with their external counterparts. They would also be neater and enjoy compatibility with all operating systems.

Why haven't the hardware manufacturers thought of this approach to compatibility?

Gavin Putland
West End, Qld

We think Gavin's suggestion for reducing the complexity of hardware compatibility is fantastic. If you're a hardware engineer, tell us if his ideas are feasible by emailing *epinions@apcmag.com*. For his creative thinking, Gavin wins our letter of the month prize: a Logitech Cordless Desktop LX 700, valued at $199.95.

spam traffic. These are also costs which we cannot recoup from our customers.

While we and many other ISPs agree that we should provide virus protection as an everyday part of our service, it isn't fair or right for people like Richard Leahy to say that we should be prosecuted for not doing so.

Viruses are a problem for everyone — you can't lump the entire blame on one group. It's impossible to deliver a usable Internet service which is completely protected against all current and future viruses.

If all ISPs had email virus checking on their servers, a lot of the viruses would disappear. But not all. Like any technical challenge, crackers would simply find another weakness to exploit and jump on the bandwagon.

The solution to the problem is education, and that starts with the retailers selling the computers in the first place. All computers should be sold with at least minimum virus protection, spam removers and all Windows security patches installed. And customers should be informed by the retailer on how to keep their system secure and antivirus products up to date.

Why do I think this? Because not only are we an ISP, we are also a computer retailer. We won't let a new machine out of the shop without all of the above being done, even though it takes a couple of hours per machine to set up. We can sleep at night knowing that it has gone out of our shop in the best possible shape. If something happens after that, like a virus, then we reinforce the importance of updating and usually it doesn't happen a second time.

Deb Youle
Waterfront Computers & Internet Service
Cowes, Vic

CRASHTEST, DUMMY!

I read with some interest the editor's column in August's edition of *APC*. I would disagree a little when it comes to the readership trusting your reviews of products.

Over the last year I have been a little disappointed in some of the reviews I have read, specifically those relating to wireless routers and large notebooks.

In the router test, many units were given good reviews as they had features such as MAC filters and port redirection. One of the units reviewed was a D-Link model. It didn't receive a good review due to, apparently, a lack of features. I have used the D-Link units a number of times and I've been wondering whether the reviewer clicked on the Advanced menu.

In your notebook test all judgments seem to come down to how fast the units run. Fast, cheap notebooks get good ratings and slow, expensive notebooks get bad ratings. Although this may seem like a small consideration in a notebook purchase, I would rather know that the notebook will still work in two years' time.

How about dropping the notebook from desk height a couple of times and see what happens; telling us how widely supported the notebooks are; asking the vendor to supply parts for a two-year old model and see who can; testing how well the built-in Wi-Fi antennae work; and telling us what the keyboard is like for touch typing?

When it comes to notebooks, reliability and usability rate well above speed. I have seen too many non-branded notebooks with cracked cases and screens, major brands with dead mainboards, power supplies and overheating issues. Your test didn't help me identify issues with the products in any of these respects.

APC is valuable for current news, articles on new products and technology, tutorials and an advertising index, but the last thing I get around to reading are your reviews of PCs, notebooks and other hardware as I find them to be of little value. Refocusing away from raw speed would do some good, I think.

Conrad Smith
Berowra Heights, NSW

Technical editor Matt Overington responds: I agree with some of your comments, and we're currently examining benchmark procedures and how we approach product reviewing in general.

The reason we use the benchmarking apps as a basis for comparison is because they provide a fair, even base for testing. As the notebook reviews published in *APC* are written by several different people, it's important for us to come up with repeatable, reliable methods for testing systems.

We get notebooks for two to three weeks, sometimes even less, so it's impossible for us to comment on how well they would work two years down the track. However, it's now standard procedure to mention the warranty terms of each product tested.

While we would love to conduct notebook torture tests, unfortunately it simply isn't possible to get vendors to agree to let us write-off a $2,000 piece of equipment for the sake of a magazine article.

Usability comments like how a keyboard feels to the touch are highly subjective, and we focus on benchmark figures to avoid subjective and meaningless reviews. Some keyboards disliked by people with large hands are praised by others with daintier mitts. That said, we are focusing on including information on keyboard layout and spacing so readers can make up their own minds.

It's extremely difficult for us to pass specific comments on support, as we generally look at notebooks that are just hitting the market. There's no way we can comment on how well they will be supported by different operating systems in the future.

Your suggestion about testing the built-in Wi-Fi antennae is excellent, though, and we're looking at incorporating that information into future reviews.

Agenda: Your place to vent

PC VACUUM CLEANERS

In the ongoing debate about of the merits of multiple quiet fans and noisier, larger fans, I can't believe nobody's talked about the risk of turning our PCs into the inside of a vacuum cleaner bag, as well as the pleasant effects it has on drive heads.

Nothing prevents effective cooling more than a nice thick coating of dust making the volume of air produced by the fan irrelevant. If you are serious about cooling, the only simple option is to blow clean air into your PC, creating a small overpressure and making the PC leak out clean air rather than sucking in dirty air.

This is most easily achieved by fitting the outside of the PC case with a decent size 240V fan providing large volume flow, coupled with a quality filter like the ones used for respiratory equipment. The old fan in the power supply should be left in as the new fan should be dimensioned to produce significantly more air than the old extracts, hence still producing over pressure.

Leif Ekmon
Cool Clean Computing
Wolkstonecroft, NSW

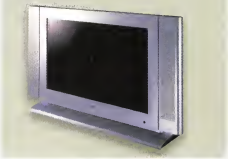
ADSL NIGHTMARE

I'm fortunate enough to live in an area of Sydney that's cable Internet-enabled and have enjoyed Optus's unlimited cable deal, which was great. But due to the monthly cost, I wanted to change to ADSL — sure it's slower, but it's still faster than a 56K modem. However, I also wanted to go with an ISP other than Telstra or Optus so I could actually get decent value for my $30. The 200MB offered by the big two won't get you far once you install virus updates, security updates and service packs.

I applied for ADSL via TPG for my mum's house (also in my suburb) and was told ADSL ▶

Prize Pit

The lucky winner of our August subscription prize of a BenQ DV2670 26in LCD TV is D. Wright of Dimbulah, Qld. Congratulations!



could not be provided as the phone line was with Optus. I then applied for my own house via Exetel and was told the same thing. Both Web sites have a feature that tells you if ADSL is available in your area and both came back okay. Do I have to switch to a Telstra phone to get ADSL? If so, this is absolutely ridiculous.

Australian ISPs have a lot of work to do. It shouldn't be this hard to get ADSL.

Anthony Abraham
Westleigh, NSW

***APC's* Dan Warne responds:**
Getting broadband is definitely too complex and frustrating for many people. However, if your phone services are delivered via Optus cable, there is a legitimate reason why you can't get ADSL — it simply can't be delivered over cable, only a copper phone line.

You should be able to apply to Optus to switch you back to a Telstra-provided copper phone line. You can still get Optus phone service over the Telstra line, though it will cost a little more than getting it through Optus's own cable network. You'll then be free to choose any ADSL ISP, provided your copper phone line is within 3.5km of the Telstra exchange and doesn't have any pair gain on the line.

Unfortunately the only way to find out whether it's possible is to apply to an ISP. Then Telstra will do a comprehensive "service qualification" on your new copper phone line.

MYOB GETTING GREEDY

I read your review of accounting packages with interest but was disappointed to see MYOB awarded the gong. It's a great program but in the last 12 months MYOB has become greedy.

I have never been one to upgrade just because a new version has arrived if I can do all I want with an existing version. I was therefore rather unimpressed to discover that MYOB now only makes its tax tables compatible with the latest version.

In my small business, this is an unwarranted expense and I say shame on MYOB for getting this greedy.

Vicki Pearson
Grose Vale, NSW

MYOB Australia general manager Andrew Fiori-Dea responds:

At MYOB, we invest considerable time and effort to implement and test payroll and tax table changes in our software to ensure our customers comply with the current tax and payroll requirements.

Since 2001, MYOB has issued complete updates for payroll to ensure customers have had compliant payroll systems.

To simply add in tax tables to older versions of our product would leave customers at risk of the software not working correctly, which would then leave them vulnerable to major problems if they were to be audited, or could lead to them making incorrect payments to staff.

To ensure compliance, customers can choose between either purchasing upgrades annually or subscribing to MYOB Cover.

With MYOB Cover, we provide automatic updates, ongoing technical support and more, all for less than a dollar a day. We believe this is a cost-effective way of ensuring our customers' payroll, software and business run smoothly and accurately.

SIZE MATTERS

When reviewing laptops, you should warn readers if a crucial specification is misleading. Take 15.4in wide-screens for example. You should advise readers that they aren't 15in screens that have been made wider. Due to the way diagonal measurements work, the screens are actually smaller but wider. I'm sure a vast majority of potential buyers are unaware of that.

Rob Crombie
Balaclava, Vic

Have your say

Add to these discussion threads or email your views (in less than 500 words) to **epinions@apcmag.com**.

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RICOH
Image Communication

DSL dramas

Major headaches still exist for some DSL-switchers, warns one *APC* reader who couldn't change to Optus no matter how hard he tried.

I need an aspirin!: *Switching service providers shouldn't cause this much grief, yet time and again, changing ISPs is more trouble than it's worth.*

Dear Watchdog,
I'm stuck in the middle of the mother of all telco stuff-ups. It's the unfortunate result of responding to a special offer of $50 credit and 5,000 Qantas frequent flyer points if I changed my telephony and broadband to Optus.

I rang the day before the offer expired and was told that I couldn't connect to Optus DSL as I already had Internode DSL connected. Nowhere in the promotion details did it say that existing DSL customers did not qualify, or that you must have already arranged a time for disconnection with your existing provider.

After many hurried calls, I placed my order to move all my services to Optus and advised Internode to disconnect me on a certain date so I could swap DSL providers.

It took two weeks for a consultant to ring me, only to say my order had been rejected. For some reason, I was asked to reorder. A week later my long distance telephony was successfully changed over, according to an automated recorded phone message.

But despite repeated enquiries, there continued to be no progress on the DSL, and after five or more phone conversations where Optus claimed to have no record of my Internet account, I resolved to reorder.

After more delays while my line was tested again for DSL compatibility, I was advised that the telephone account was in my wife's name and she would need to organise the DSL. I queried this, as our Telstra account is in joint names, and I had placed the order for transfer. How could it now be in my wife's name?

I was told it could not be explained and would be quicker for my wife (who was at work at the time) to authorise the change than wait a week or so for the phone account to be changed over to joint names.

Again there has been no action on the ADSL link I rely on and have been without for a week. It is now five weeks since I placed my initial order and I cannot easily go back to my old providers, Telstra and Internode, as I contracted my phone over as part of the deal.

It seems that every "customer avoidance" trick in the Dilbert cartoons has been used on me by Optus staff.

Robert Lloyd
Seacombe Heights, SA

Watchdog contacted Optus and asked why it had been *so* difficult for Lloyd to change Internet providers. An Optus PR manager responded:

Dear Watchdog,
As a reseller of the DSL service, Optus is reliant on its wholesale provider [Telstra] for the provision of ports to enable a DSL connection. During May and June, our wholesale provider saw orders delayed by a shortage of ports in the DSL infrastructure they share at some telephone exchanges. This problem would not have been specific to any one DSL provider.

As soon as our wholesale provider installed additional DSL ports at Mr Lloyd's local telephone exchange, Optus successfully installed the DSL service at Mr Lloyd's residence.

Optus values Mr Lloyd's business and regrets he experienced some delay in getting his service activated. We will endeavour to improve the timeliness and accuracy of our communication to customers who may experience a "No Ports Available" delay. Optus is happy to contact Mr Lloyd to resolve the matter and avoid any issues going forward.

Sheila Dhillon
corporate affairs manager
consumer and multimedia (CMM)
Optus

Auctioned software no bargain

Dear Watchdog,
Recently I purchased a copy of Norton AntiVirus 2004 on eBay. Following two system crashes I managed to install the program and attempted to activate it via the Symantec telephone support number.

After a relatively short period of time I was connected to an operator who informed me that unless the software was a boxed copy with the relevant licence, I didn't have any hope of reactivating the software.

What happens if the software is included in an OEM version supplied with a motherboard? I purchased a sealed CD, with a serial number printed on the CD sleeve — it is certainly not an illegal copy.

This is not a complaint against eBay or the person who sold me the software but against Symantec. What use is bundled software if you cannot activate it?

Wayne M Pavy
Blackwood, SA

Dear Watchdog,
We are sorry to hear about Mr Pavy's recent experience. Unfortunately, Symantec is unable to verify the validity of software that is sold on eBay or any other unauthorised sites.

Our recommendation is that customers purchase our products from either online stores or from our worldwide network of resellers in order to avoid any risk of inadvertently purchasing pirated software.

By using copied or counterfeit software, customers expose themselves to a number of risks including dangerous software viruses and other malicious computer code, corrupt disks or otherwise defective products, inadequate or no product documentation, insufficient warranty protection, lack of technical support, software compatibility problems and ineligibility for product upgrade rebates.

In addition, our 2004 OEM software does not have product activation, so this should not be an issue either.

Norm Kohlberger
senior regional product manager
Symantec

Contact us

WE WANT TO KNOW
how IT companies are really treating you. Letters must be under 500 words and include your full contact details and any product information. Write to: watchdog@apcmag.com or PO Box 4088, Sydney NSW 1028. All correspondence becomes the property of *APC* and is subject to editing.

Lloyd's initial problem — that Optus couldn't connect him until he fully disconnected from Internode — is the result of Optus not participating in the industry-wide DSL transfer process. Any provider that offers services over Telstra's network, including Optus, can opt to participate in the process, but Optus chooses not to. As a result, its existing customers can't as easily change to another ISP, and in Lloyd's case, he couldn't easily change from another ISP to Optus.

A list of ISPs participating in the DSL rapid transfer process can be found at *www.apcmag.com/info/FastChurn*.

Lloyd eventually got his DSL connection through Optus, though he had to do his own detective work.

As per its response to Watchdog, Optus told Lloyd it couldn't connect him because all the ports in his exchange were full. He contacted Internode to ask whether he could get his old service back, relaying Optus's advice that there were no ports left in the exchange. Internode advised that there were ports available, a fact he went back to Optus with, which then connected him.

"My complaint is really that no-one at Optus gave me a straight answer," said Lloyd. "There's no single department you can ring to get your problem chased up and resolved."

TARDY SERVICE FROM ONLINE RETAILER

Watchdog was contacted by two customers regarding online store I-Tech (*www.i-tech.com.au*) to complain about slow service.

Dear Watchdog,
I purchased a motherboard at I-Tech which later became faulty. There has been a huge delay in replacing the motherboard under warranty — over a month now. When I called I-Tech, they couldn't even find me on their computer! They then put me on hold for 15 minutes, at which point I hung up. I need my computer for my work, and this is just not good enough!

Andreas Fisher
Jindabyne, NSW

Dear Watchdog,
On 27 May, I ordered two BenQ monitors from I-Tech. I paid by credit card over the phone and it was charged two days later. I was told categorically the monitors were in stock and would be shipped that day. Nearly two weeks later I have received nothing, even though I've already paid. I'm feeling completely duped and have to keep telling my four-year-old son he can't use his computer as the screen won't work until I get a new one.

Tiffany Hunt
Hay, NSW

I-Tech responded promptly to Watchdog's inquiries and appeared sincerely apologetic about the delays.

Dear Watchdog,
We've looked into Andreas Fisher's case and we're very sorry about this incident. We received the faulty motherboard in mid-May and only sent the replacement back to him in June. Unfortunately, the delay was out of our control as most faulty products are passed back to the distributor for repair or replacement. If the fault was dead on arrival, we would have sent a replacement to him within seven working days, but it wasn't the case here.

All of us at I-Tech were aware of the incident with Ms Hunt's purchase. At the time of her conversation with our sales people, we had three of the model of monitor she wanted to purchase in stock. When the invoice was processed, all three had been allocated to another customer just minutes before her order. We contacted our distributor immediately to confirm that more of the same monitors were coming into our warehouse and were assured stock would arrive the next day. Unfortunately, this didn't happen.

We have rectified this matter with Ms Hunt and sent her a complimentary gift to apologise for the inconvenience caused.

Simon Chan
I-Tech Group

Dead pixel policy zeroed

Ian Stewart from Melbourne contacted Watchdog to query Acer's zero dead pixel policy. "The guarantee influenced my sister's decision to purchase an Acer laptop," Ian told Watchdog. "But unfortunately she didn't check the screen on pickup and when she got home, she found it had a permanent white pixel."

When Ian and his sister returned to the Dick Smith store where the machine was bought to request warranty service, they learned that Acer had withdrawn its zero dead pixel warranty prior to the date of the notebook's purchase.

The warranty was withdrawn due to a shortage of panels

Acer told Watchdog the policy had been withdrawn due to a severe shortage of LCD panels. A spokesperson said consumers were given fair notice through retail shops, where the warranty was originally promoted.

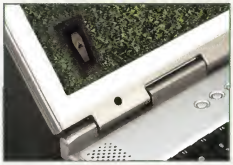
"In addition, Acer endeavoured to contact all relevant media [to advise] of the changes to the PixelPerfect Guarantee," he said.

From March 2004, the zero dead pixel warranty changed from a free part of Acer's standard warranty to an optional warranty upgrade with an associated cost. Unfortunately, Ian's sister hadn't heard of the change before she purchased the notebook.

"Acer is the only major IT vendor that offers a perfect pixel warranty upgrade and two hour turnaround on notebook repairs," an Acer spokesperson concluded.

Ian says that after his sister's experience, other readers should switch on a computer or monitor before purchasing it to ensure that there are no dead/bright pixels on the display. If a retailer won't let you, take your business elsewhere.

It's fair enough for a vendor to change its warranty terms provided it publicises the change and modifies its ongoing advertising. However, Ian's sister's experience also highlights the importance of readers clarifying exact warranty terms before purchasing an item, and preferably getting it in writing. As always, "caveat emptor" — buyer beware.



Buyer beware: *check monitors and notebooks for dead pixels before you leave the place of purchase.*

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Model	Size	Optimum Resoloution	Brightness	Response time	Input
[illegible]	[illegible]	[illegible]	[illegible]	25 ms (Tr + Tf)	Analog: 15pin D-sub
[illegible]	[illegible]	[illegible]	[illegible]	[illegible] (Tr + Tf)	Analog: 15pin D-sub Digital: DVI-D
[illegible]	[illegible]	[illegible]	[illegible]	12 ms (Tr + Tf)	Analog: 15pin D-sub Digital: DVI-D

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REAL WORLD ★TESTING★

On Test

Detailed product reviews and comparisons

apc Labs Challenges

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Change for the better

Editor's Choice
October 2004

Editor's Choice: *this is awarded to the product that offers the best blend of features and performance. This product stands aut abave the competitian as simply the best in its field. A product must scare 4.5/5 ta qualify.*

Highly Recommended
October 2004

Highly Recommended: *awarded ta products that dan't quite make Editar's Chaice, but still stand aut due ta a particular feature ar averall perfarmance. Any product scaring 4/5 qualifies.*

Best Value
October 2004

Best Value: *as* APC *hands aut Editar's Chaice and Highly Recommended awards based an features and performance, after there's a standaut product at a law price that misses aut. This award is presented to the product which falls highest abave the line af expectatian in the Price-ta-Perfarmance graph (see belaw).*

At the time of writing, the *APC* Labs were filling up with PCs purpose-built for video editing from major brands and some lesser-known players. We're running through each machine, closely examining it for raw performance, stability, suitability for video editing, quality of components, and value for money.

Buyers of these systems will be pushing them hard every day and can't afford breakdowns, shoddy components or poor assembly. It takes several days to adequately and thoroughly test each system, but the time invested here in the Labs provides a clear picture of which machines are worthy of recommendation and which are, quite frankly, absolute lemons.

On Test is designed to provide unbiased, critical reviews of whatever software, hardware or peripheral products that interest you. Recently we've introduced the Price-to-Performance Ratio in Labs Challenges because we think it helps simplify the process of picking which products perform best, relative to the rest of the pack.

THIS MONTH'S LABS CHALLENGES

One of the most exciting aspects of working with technology is the rate of change. Technological developments are so rapid that products can move from the drawing board to the mainstream in months instead of years.

Take ultra-portable projectors, for example. Not long ago, you needed a big, beefy machine with a powerful bulb to present in a brightly-lit environment. In fact, many corporate headquarters had a dedicated projector room, where meetings and presentations could be given in a darkened environment.

Times have changed, and 2,000 ANSI lumen projectors can now be packed into notebook bags and taken to sales presentations. Coupled with a portable screen, these units liberate offices, sales staff and trainers by giving them the ability to work anywhere, any time.

Although business projectors are generally used around the office and out on the road for presentations, we know that many of these make it home on the weekends for movie nights. While our tests focus on boardroom performance, we also spend some time measuring contrast levels and performance for movie playback.

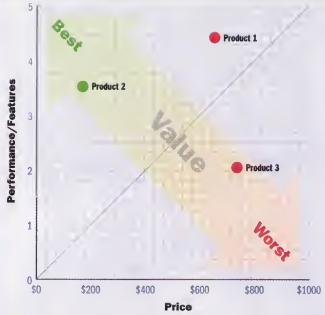
In a similar vein, many small businesses are beginning to realise the benefits that can be garnered from running a server to help pool resources. Shared calendars and contacts, files and content management systems can help boost productivity, and it's now straightforward to install and configure a system. Developments at the enterprise end of the market have pushed small business servers down to less than $3,000, including a copy of Microsoft Small Business Server 2003 or an enterprise-grade Linux distribution.

The final Labs Challenge this month looks at water-cooling kits. Apple has just launched a water-cooled G5, but hardcore geeks have been overclocking their systems and installing liquid-cooling for years. This technique is the ultimate way to get a quiet, stable and cool machine, but many are deterred because of the risk of leaks and damage to components. We've done the dirty work by setting up, testing and evaluating the leading products on the market to report on the designs that perform and those that just look the part.

Matthew Overington
Technical Editor

What do you think? Could we do it better? Drop us a line at *OnTest@apcmag.com* with your comments or suggestions.

apc price-to-performance ratio



The APC Price-ta-Performance Ratia is a scatter graph, each paint representing a reviewed praduct. The X-axis provides a price scale, and the Y-axis indicates features and perfarmance as derived fram the verdict awarded ta each item. The diaganal line represents a line af expectatian — as prices increase, a prapartianal increase in features ar perfarmance is alsa expected.

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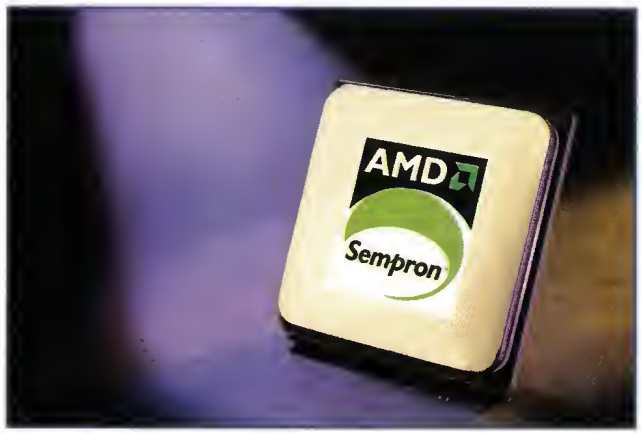
AMD's big little processor

AMD is revising its product line by introducing a new entry-level processor. Is this the ideal lounge room CPU? *Matthew Overington* and *Nick Race* report.



New chip on the block: *introducing AMD's entry-level Sempron processor.*

AMD has made tremendous headway into Intel's market dominance in the past year and has driven 64-bit computing into the mainstream. The company is undoubtedly the leader in inexpensive 64-bit systems, but while AMD has done well out of its performance line of 64-bit processors, the entry-level end of the market sees more unit sales.

A cheaper alternative to AMD's flagship 64-bit units is essential for the company if it wants to remain a significant player in consumer IT. The Duron range has traditionally filled this space, though recent Athlon 64 releases have made the Duron appear dated. The 32-bit Athlon XP now fills the middle ground.

The PC industry is accustomed to seeing deadlines slip and major manufacturers miss shipping dates for both hardware and software releases. AMD bucked the trend by releasing the Sempron processor on 28 July, three weeks ahead of its scheduled 17 August launch date.

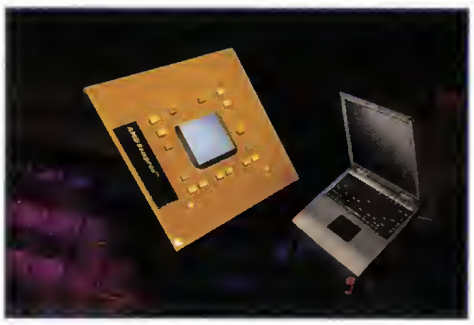
AMD is labelling the Sempron as its value processor and is pitching it at both consumers and businesses. It replaces the Duron line and is shaping up to offer real competition to Intel's Celeron brand. The Sempron is a great choice for DIY enthusiasts looking to build up inexpensive machines for use as media PCs, Internet gateways or production systems.

All Sempron processors are 32-bit, and focused on the lower end of the market where processing requirements aren't huge. With this release, AMD is seemingly saying that power users demand 64-bit processing capabilities, but that's overkill for most home or office tasks.

The Athlon XP will be phased out before the end of this year, leaving Sempron as AMD's x86-based processor and the Athlon 64 as the performance model. The most immediate and notable effect will be to reduce the possibility of confusion among consumers, as there are currently a number of different Athlons on the market.

On the road again

AMD has also released a number of Mobile Sempron processors to complement the desktop range. All processors are packaged in the Socket 754 lidless micro PGA form factor, though the range is pitched at a number of different platforms. The base model processors (Mobile AMD Sempron 2600+ and 2800+) have a thermal specification of 25W, which enables them to run in thin and light notebooks. The higher models (Mobile AMD Sempron 2600+, 2800+ and 3000+) have a thermal specification of 62W. These are likely to appear in larger budget notebooks aimed at students. Overseas, a number of manufacturers are offering machines built on Mobile Sempron processors. Expect local partners including Acer, Medion, Optima and Twinhead to follow suit.



On the move: *Mobile Sempron processors complement the compony's ronge of desktop chips.*

LAUNCH NOTES

The processor launched at a number of different speeds on the Socket A architecture including 2200+, 2300+, 2400+, 2500+, 2600+, 2800+ and one on the Socket 754 form factor, numbered the 3100+. This system, while making it easier for most consumers to choose a platform, will result in some short-term headaches for box builders.

The Semprons up to and including 2800+ are designed to fit Socket A motherboards, while the 3100+ (and above, when released) run on the Socket 754 design like the early Athlon 64s. There is a plan to migrate the higher-clocking models across to Socket 939, but AMD is waiting until Socket 939 reaches wider acceptance in the market. All models are built on a 130nm process in AMD's Dresden fabrication plant.

All Socket A models feature a frontside bus speed of 333MHz and support for up to PC3200 DDR Memory (400MHz), while the 3100+ is built on Athlon 64 technology and features a 1,600MHz system bus and integrated memory controller.

BUILT-IN PROTECTION

The top processor is basically a 32-bit version of an Athlon 64 and includes a number of features previously only found on 64-bit processors. The NX (or No-Execute) flag is designed to help quell the spread of viruses and worms by preventing malicious code from execution at a hardware level. It requires SP2 to work correctly and doesn't allow worms like Blaster and Sasser to slip instructions into the pipeline and execute unwanted code. Security pundits hope this will help stem the onslaught of worms that has plagued the Windows platform.

Cool'n'Quiet is similar to Intel's SpeedStep technology and is designed to regulate CPU voltage and frequency to ensure that it runs at

optimum levels. The processor responds to increased workloads, meaning that the PC doesn't run hotter than it needs to, but power is there when required. More details can be found at **www.apcmag.com/info/Cool_N_Quiet_guide**.

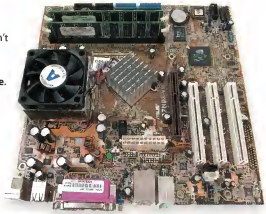
LOCAL AVAILABILITY

Although AMD is relying on resellers to set final local pricing, the Sempron 2800+ launched at US$109 each for batches of 1,000. This puts the processor head-to-head with the Socket 478 Celerons in terms of price. AMD currently has the technological advantage by offering the Athlon 64's features on the Sempron 3100+, but this will be negated early next year.

Intel is planning to launch updated Celeron D processors in the first quarter of 2005 that are designed to run on the Socket 775 form factor. These new models will feature a J suffix and contain an "execute disable" bit (similar to AMD's NX flag) and Thermal Monitoring 2 (which controls the thermal output).

The lower-end Semprons, built on the ageing Socket A architecture and slow 333MHz frontside bus, have a limited life span but only generate 62W of heat, compared to Celeron's 73W. This makes it a good choice for any application that requires a quiet computer. Although few big name manufacturers currently build machines using AMD processors in Australia, Optima has announced a number of systems, including the WorkPro, built on a Sempron 3100+ processor.

APC benchmarked a Sempron 2800+ on an ASUS A7NBX-VM motherboard, featuring 512MB of Infineon PC3200 DDR RAM, onboard video, a Western Digital Caviar WD1200BB Parallel ATA drive and Windows XP Professional (running SP1). The unit achieved an impressive 19.4 under Business Winstone 2004 and a Multimedia



Diving platform: *the Sempron provides an excellent launching point for high-performance, low-cost systems.*

Content Creation Winstone 2004 score of 23.4. These benchmarks indicate that the processor is up to just about any word processing or media playback task, and could even run at a decent clip with half that amount of RAM.

Many systems built on these entry-level processors are destined for humble lives as media players or Internet boxes and will rely heavily on integrated components. AMD buyers are better off as they have the choice of motherboards running on inexpensive chipsets from VIA, SiS and Nvidia.

At the entry level, most AMD motherboards come with Nvidia onboard graphics, which provide superior video performance over the 865G Extreme solution favoured by most Intel buyers. Both are inadequate for running modern games, but the Nvidia solution offers superior video playback. In an area where value for money is important, this could be enough to see the Sempron become the platform of choice for lounge room computing. ETTP

Codename: Roadmap

A Sempron processor is actually one of two cores. All but the 3100+ Sempron are currently based on the Socket A technology of the Athlon XP family. The 3100+ and newer, unannounced Semprons (codenamed Palermo) are based on the Athlon 64 core. As speeds in the Athlon 64 range increase, slower chips will drop down into the Sempron range in a 32-bit incarnation, until Socket A technology is phased out. There's no timeline on this process, though AMD's manager for Australia and New Zealand, John Robinson, has indicated that Athlon XP processors will be gone by the end of 2004.

With the workstation Athlon 64 processor now running on Socket 939, developments are steady. Current and upcoming chips are based on the Winchester core, built on a 90nm SOI fabrication process. No replacements have been announced until at least the end of 2005.

AMD's Athlon FX series chips are indicated on AMD's roadmap, and a few changes are in the pipeline. There will be a switch to the 90nm SOI fabrication process (codenamed San Diego) early next year. A dual core model (codenamed Toledo) is slated for the second half of 2005.

Processor details

Processor	Clock speed (GHz)	Packaging	Frontside bus (MHz)	Cache Level 1/Level 2 (KB)
Sempron 2200+	1.500	Socket A	333	128/256
Sempron 2300+	1.583	Socket A	333	128/256
Sempron 2400+	1.667	Socket A	333	128/256
Sempron 2500+	1.750	Socket A	333	128/256
Sempron 3100+	1.800	Socket 754	1600	128/256
Sempron 2600+	1.833	Socket A	333	128/256
Sempron 2800+	2.000	Socket A	333	128/256
Intel Celeron D 320	2.400	Socket 478	533	16/256
Intel Celeron D 325	2.530	Socket 478	533	16/256
Intel Celeron D 330	2.667	Socket 478	533	16/256
Intel Celeron D 335	2.800	Socket 478	533	16/256

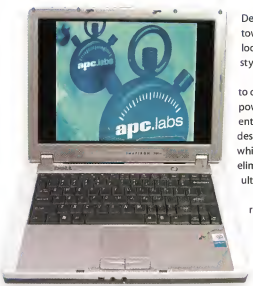
Row competition: *AMD has released a range of Sempran processars at varying speeds ta take an Intel's Celeran range.*

Details

Contact	AMD
Phone	(02) 8877 7222
Online	www.amd.com.au
Price	TBA
Intended market	Everyone
✔	Solid performance.
✖	32-bit only.
Verdict	★★★½☆

Dell Inspiron 700m

Dell's newest addition to its Inspiron range offers a fantastic blend of power and features for busy executives.



Clackety-clack: *a cramped and imperfectly domped keyboard lets this otherwise top machine down.*

Dell positions its Inspiron range of notebooks towards business users, and the sleek 700m looks good enough to mix it with the latest stylish releases from Sony and ASUS.

At 1.9kg, the new Inspiron is light enough to carry around all day but has enough power to drive serious applications. The entire underside of the chassis is metal, designed to provide a strong platform while dissipating heat. It also serves to eliminate the lateral flex common to many ultra-portable units.

The unit features a wide-screen display running in a native resolution of 1,280 x 800 pixels, with an aspect ratio of 16:10. And while the screen only measures 12.1in diagonally, it manages to squeeze in plenty of information. This screen shape makes sense for mobile users as it closely mirrors the shape of the keyboard and enables the 700m's chassis to be shallow while still including a full suite of notebook hardware.

The 700m, which has been built on the i855 chipset, is a screamer on paper, boasting a 1.8GHz Pentium M processor, 1GB of RAM and an 80GB 5,400rpm hard disk. These are impressive specs for any notebook, let alone an ultra-portable.

The rest of the machine's specs are similarly impressive, boasting SD and PC Card readers, VGA and S-Video outputs, two USB 2.0 ports and a FireWire connector. A 56K modem, 10/100 Ethernet and 802.11g Wi-Fi round out the connectivity options. Dell advises that no Bluetooth module for this system is available.

The screen has a special high-gloss coating, as seen on a number of Toshiba and Sony units through *APC* Labs in recent months. This substantially boosts the clarity of a standard TFT screen, though at the expense of some additional glare. However, the glare is offset by the screen's brightness, which makes it fantastic for watching DVDs and working in brightly-lit environments.

Highly Recommended October 2004 apc

Details

Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	$3,399
Intended market	Corporate/small business
✔	Light; stylish; powerful.
✖	Clacky keyboard; Windows XP Home; poor battery life.
Verdict	★★★★☆

Benchmarks

Business Winstone 2004		
0	21.2	40
Multimedia Content Creation Winstone 2004		
0	24.7	40
BatteryMark (hr:min)		
0	1:39	6:00

Top specs mean impressive benchmarks but poor battery life.

POWER TO BURN

The Inspiron 700m effortlessly cruises to a score of 21.2 under Business Winstone 2004, backing that up with a result of 24.7 under Multimedia Content Creation Winstone 2004. The onboard graphics controller isn't able to muster a strong showing under 3D benchmarking, but this machine wasn't designed for gaming.

While far from perfect, the one hour and 39 minutes of battery life should be adequate for most users. The machine ships with a four-cell battery, but Dell also offers an eight-cell unit for $169 which should push battery life out to around five hours. Extra four-cell batteries are $127 each, but the eight-cell unit is the better buy if you're shopping for a spare.

OFF KEY

Unfortunately, in a class where many sacrifices have to be made to fit all the components into a tiny space, Dell has skimped on the keyboard. While thin and light notebooks are renowned for poor keyboards, the Inspiron 700m suffers more than most.

The keys, though generally well laid-out, suffer a couple of minor issues. They have some slight lateral movement and are quite clacky to type on. This makes it difficult to type quietly — an issue that can drive a user's fellow workers to distraction.

The keyboard also features shrunken comma, full stop and question mark keys between the M and right Shift that may pose difficulties for touch typists. However, keyboard comfort is subjective, which is why you should always try out a notebook before committing to a purchase.

Another negative point against the Inspiron is the fact that it ships with Windows XP Home, which doesn't really cut the mustard in a corporate environment. However, Windows XP Professional is available for an additional $109. It provides the notebook with the ability to connect to a domain and offers power user goodies such as FireWire networking.

Although software generally incurs an extra cost, Dell has bundled some software with the system, including Dell Media Experience, CyberLink PowerDVD and a 90-day trial version of Norton Internet Security 2004. Discounts on the full versions of Norton Internet Security and Microsoft Office Basic are also offered.

All up, Dell has done a great job with the Inspiron 700m. It's light and powerful, and when fitted with a copy of Windows XP Professional and an eight-cell battery, would be a top-notch machine for any frequent traveller with deep pockets.

Matthew Overington

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Shuttle XPC SB81P SFF

Shuttle's new small form factor kit puts the Taiwanese manufacturer back at the forefront of system design.

Small but powerful: *the Shuttle XPC SB81P SFF squeezes plenty of hardware into a small space.*

The Alderwood and Grantsdale chipsets were always set to turn the PC market upside down. Now third parties have had time to perfect their i915 and i925 offerings, new products are being released to satisfy the early adopters and performance buffs. Shuttle's SB81P barebones kit takes advantage of the new i915 chipset.

Historically, small form factor (SFF) boxes have been a trade-off between the convenience of the diminutive unit and upgradeability. The SB81P neatly fits in three 3.5in hard disk drives, a 6-in-1 card reader and a 5.25in optical drive into the case.

ON THE INSIDE

The small box packs a punch: the motherboard features a Socket 775 Pentium 4 CPU slot, four Serial ATA connectors supported by an Intel ICH-6R RAID controller, a single Parallel ATA connector for optical drives, a PCI slot and a single PCI Express x16 slot for a video card.

Up to 2GB of dual-channel DDR memory is also supported. DDR RAM has been chosen over DDR2 because it's cheaper and, for the moment at least, faster. Testing with DDR2 RAM shows current performance to be on par or even slightly lower than DDR on the 915 chipset due to higher latency timings, and it may be some time before the real benefits of DDR2 become apparent.

Shuttle has fitted a quiet and powerful 350W power supply into the SB81P. This supplies more than enough grunt to power hard disks and peripheral devices, and is even up to driving power-hungry video cards.

The airflow for the CPU runs across the width of the case. Cool air is drawn from the side of the box and channelled across a heat pipe-driven heatsink. As cooler air is used, the fans can be driven more slowly, reducing noise.

Building the system up is a simple affair. Shuttle claims tool-less servicing on the SB81P, though a screwdriver is required to remove and replace the CPU heatsink. All drives attach with tensioned drive rails, which don't require screws. Two plastic tabs keep the drive cage containing the primary hard disk drive, optical drive and the card reader firmly affixed.

Two additional 3.5in hard disks can be installed if required. Two small fans at the top rear of the case blow air over the mounted hard disk drives, keeping them cool in the tight space.

UP TO SCRATCH

Out of the box, the SB81P uses the Intel Graphics Media Accelerator (GMA) 900 to provide 2D and 3D functionality. Though underpowered for current high-end video games, the GMA 900 is more than adequate for day-to-day use, as proven by a score of 1,422 under 3DMark2003.

Fitting a more capable graphics adaptor is a breeze thanks to the inclusion of a PCI Express x16 slot. The case is designed to accommodate the larger cards on the market today, though judicious use of internal power extensions may be required for the more power-hungry video cards. An Nvidia GeForce 6800 GT was fitted for 3D testing, but the shroud for the CPU cover needed to be removed to fit the card.

The front of the case sports one FireWire 400 and two USB 2.0 ports, a microphone in and headphone audio connectors. There's also a pre-installed 6-in-1 card reader with support for Memory Stick, Secure Digital, Compact Flash, MultiMedia Card, Smart Media and MicroDrive.

Bundled with InterVideo Home Theater software, the SB81P has more than enough power to act as a media server, though you'll need to buy a separate remote control. Supporting 7.1 audio, optical S/PDIF in and out, coaxial S/PDIF in, headphone output and an analog line in, connections to any speaker system or home entertainment equipment is easy.

The 915 chipset performs well across all tests. A score of 4,693 is achieved in PCMark04 using onboard graphics. A Business Winstone of 23.6 is within the expected range for the 915 chipset and a Multimedia Content Creation 2004 Winstone of 32.3 is close to that of the Intel reference board when tested with 1GB of RAM and PCIe video card.

When tested with a high-performance Nvidia 6800 GT PCI Express video card, the Shuttle manages a PCMark04 score of 5,337 and 10,755 under 3DMark2003. These are some of the highest scores ever seen in the *APC* labs.

The Shuttle SB81P constitutes a solid base from which to build a powerful system. With a variety of connectivity options and plenty of room for both a top-end video card and a number of hard disk drives, the SB81P is a winner.

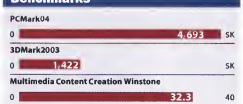
Nick Race

Editor's Choice
October 2004
apc

Details

Contact	Sato Technologies
Phone	(02) 9748 2999
Online	www.satotech.com.au
Price	$729
Intended market	Prosumer, performance enthusiast
✔	Connectivity options; quiet.
✖	Only has room for one optical drive.
Verdict	★★★★½

Benchmarks



The 915 chipset proves a top performer across all tests.

WARNING

WARNING

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WARNING

Shuttle XP17 LCD monitor

A new form design makes transportation easy, but a slow refresh rate may scare away gamers.

Taiwan's Shuttle Corporation initially became well known for its range of small form factor PC enclosures. The company has since sought to flesh out its range of barebones kits with the introduction of a number of accessories such as remote controls and Bluetooth and Wi-Fi modules. With the release of the XP17 17in LCD monitor, Shuttle has taken the next step toward providing a complete branded solution.

Embedded in a flat sheet of tempered glass surrounded by a tube aluminium frame, the screen gives the impression that it should be able to take quite a battering.

Standing on a swing-out back support in an easel-like configuration, the monitor is quite stable thanks to its width and non-slip pads on the frame. The unit can be adjusted by moving the back support in and out, but because of its tripod arrangement the screen will always be tilted up from the desk. The back mount can also swivel 90° for use in portrait mode.

An external 12V AC adaptor means that when folded, the screen measures a svelte 8cm deep. An integrated handle makes transportation a cinch and the supplied carry bag offers excellent protection when moving the screen. The bag has sufficient room to carry cables, a keyboard and mouse as well as the monitor.

The Shuttle XP17 supports a native resolution of 1,280 x 1,024 pixels, though gaming at this resolution requires a very beefy video card. The 16.2 million colour range will be suitable for everyone except graphic designers relying on the colour accuracy of the display.

In testing, the screen makes short work of the DisplayMate benchmark for clarity and brightness. Nokia's Monitor Test application shows clear delineation of brightness from 1%. These gruelling applications run the screen through a wide range of colour, brightness, saturation and moiré tests.

The monitor itself is great: it's distinctive, clear and bright. The only problem is the refresh rate: a 16ms pixel response time is almost unforgivable in an LCD monitor aimed at the performance market. Though Shuttle's design is first-class, this one flaw makes the screen less appealing to the fast action game aficionado.

Nick Race

Details

Contact	Sato Technologies
Phone	(02) 9748 2999
Online	www.satotech.com.au
Price	$999
Intended market	Prosumers, performance enthusiasts
✔	Easily transportable; rugged.
✖	Slow refresh rate; expensive.
Verdict	★★★½☆

Lexmark X4270 All-In-One Office Centre

Lexmark's small-biz multifunction centre is a solid choice for businesses with light demands.

Multifunction centres (MFCs) are being held responsible for a slump in dedicated flatbed scanner sales as businesses look to save space and money. Although many of the X4270's fax, telephone, colour printer, scanner and copier functions would be useful in a home environment, the machine is ideally suited to small businesses looking to consolidate several pieces of hardware into a single device.

The handset includes a 79-number speed dial function and features a 33.6Kbit/s fax/modem. Many devices in this price range rely on Windows to handle copying and faxing, meaning that they don't work under Linux. The X4270 is an exception, and includes internal memory for handling 160 pages. It supports fax forwarding and also works flawlessly with answering machines. The group fax function enables you to send a single fax to multiple recipients.

Print resolution is an excellent 4,800 x 1,200dpi for colour and 2,400 x 1,200dpi for monochrome. It performs acceptably under benchmarking, managing nine pages per minute in draft settings and four in high-quality mode. Printed sheets show minimal signs of banding or smudging and the draft mode produces pages of sufficient quality for use in office environments.

The print head is included with the cartridge, so you effectively get an entirely new print system when you replace cartridges. Regular black and colour cartridges rated to 600 pages at 5% coverage are available for $53.99 and $64.99 respectively. Heavy users should opt for Lexmark's high-yield units, rated to 1,100 pages at 5% coverage for $65.99 (black) and $86.99 (colour).

The scanner runs at an optical resolution of 600 x 1,200dpi and produces reasonable results. It's ample for office copying and printing, but shows signs of banding on monochrome scans.

Lexmark's control software is easy to install and use, and a single reboot enables the user to access common functions from a unified interface.

One of the X4270's most impressive features is Lexmark's one-year warranty, whereby the company handles the collection and return as well as repair or replacement of any faulty machine.

Matthew Overington

Details

Contact	Lexmark
Phone	1300 362 192
Online	www.lexmark.com.au
Price	$249
Intended market	Business
✔	Excellent warranty.
✖	Banding on monochrome scans.
Verdict	★★★½☆

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WatchGuard Firebox X500

WatchGuard's all-in-one firewall simplifies Internet security for small to medium businesses.

Security guard: *WatchGuard's Firebox is the ultimate firewall for SMEs.*

Choosing an appropriate firewall for a small to medium business can be a tricky task. While many high-end hardware appliances exist, buyers are generally locked into a specific hardware product due to a lack of expandability. However, there's little point in investing in a hardware solution if it isn't going to grow with your company, and placing a bottleneck on an incoming Internet or wide area network (WAN) connection is a recipe for lost productivity.

WatchGuard has been a player in the local enterprise firewall space since 1997 and has recently launched a one-size-fits-all hardware firewall in several configurations. The unit includes six Ethernet ports — three are enabled by default, the other three can be turned on for an additional charge. This ability to segment the network at the firewall is a handy feature for IT administrators, though some will still rely on their existing topology. A serial port is present for those looking for console control.

LINUX STABILITY

Inside the box is a regular mini PC running on a 1.26GHz processor and 256MB of RAM with 64MB of flash memory. Linux drives the system, meaning that it's not only exceptionally stable, but also upgradable. The company sells the same physical hardware at several different price points, depending on the software options.

By default, the Firebox X500 supports 250 authenticated users and offers a firewall throughput of 100Mbit/s. This can be upgraded to the X700, which offers a throughput of 150Mbit/s, and then the X1000, which offers support for 1,000 authenticated users and a throughput of 225Mbit/s. The final step is up to the X2500, which offers a throughput of 250Mbit/s, 5,000 authenticated users, and a maximum of 500,000 concurrent sessions.

The chassis of the machine is designed to slip into a single rack slot, and configuration is straightforward. The user must first set up the IP addresses of the unit, and then configure the box itself using the bundled WatchGuard System Manager. There's no Web management interface as yet, but it's in the pipeline.

An LCD panel provides feedback, detailing CPU and memory usage and which ports are in use. This is a great feature as the administrator doesn't have to run monitoring tools.

STARTING SMALL

Although the list of features is comprehensive, the X500 base model is pitched at businesses and enterprise customers that haven't previously used a hardware firewall. All models in the range offer the same basic features, and administrators can pay for additional network user support.

The range employs WatchGuard's intelligent layer switching (ILS) technology to step through the features, all of which are turned off by default. This allows the administrator to enable features if and when they're needed. Each Firebox model includes authentication, a firewall, VPN services, application-layer inspection, a rules-based email filter that can be used to control spam, and a content filter for controlling access to Web sites.

One excellent feature is a protocol-anomaly detector that looks at packets sent through the device for anything that doesn't adhere exactly to protocols. This forms a safety net for any malicious data that has slipped through the other traps.

SpamScreen, the email blocker, relies on rules to screen out spam and does a reasonable job. Although it's not as flexible as a desktop-based software solution, it does prevent a good deal of spam from hitting your internal network. Spam can be blocked directly or marked with a tag so it can be filtered by desktop email apps. This is a great feature as it prevents emails from being lost due to an over-zealous firewall application.

The content filter, WebBlocker, is easy to configure and is effective at preventing access to sites that employers would rather ban from the workplace. It's also possible to block access during certain times of the day or on a per-user basis.

SECURE VPN

An increasing number of professionals are working from home, and many corporations are demanding that users telecommunicate via VPN connections. VPN has become de rigueur in the last few years, and pass through is now supported by most ADSL modems on the market. Both IPSec and PPTP are supported, though IPSec support requires an additional licence.

WatchGuard quotes an 80% success rate at blocking viruses, and during our tests we attempted to send infected files through the firewall. On each attempt, the box successfully stripped out the virus.

Matthew Overington

Enterprise ready

Although the WatchGuard Firebox is designed to grow with your business, dedicated small business or enterprise customers may want to look at some other solutions before committing to a purchase. Symantec offers a range of hardware firewall products, starting with the Symantec Gateway Security 300 Series unit designed for small businesses. The base model retails for $799. More information, including local contact details, can be found online at *www.symantec.com.au*.

Editor's Choice
October 2004
APC

Details

Contact	WatchGuard
Phone	(02) 8912 2199
Online	www.watchguard.com
Price	X500, $3,150; X700, $3,750; X1000, $4,950; X2500, $7,850
Intended market	Enterprise/business
✔	Upgradeable; solid business firewall.
✖	No Web management.
Verdict	★★★★½

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Picasa 1.618

The latest addition to the Google family is a godsend for anyone having trouble managing digital images. And it's free.

Editor's Choice
October 2004
apc

Keeping track of digital images and videos can be a monumental task. While applications like PaintShop Photo Album 5 offer a range of features for power users, there's now significant competition from free apps.

Picasa delivers unrivalled control over images and is one of the best image viewers available today. The app trawls your hard disk for photos, and then catalogues them by date taken. The screen is split into two panes: the left contains album names as derived by folder names and file information, and the right displays thumbnails of all the images in each album.

The screen layout is intuitive and easy to use — it looks and feels much like Apple's iPhoto. Images can be dragged into a "Picture Tray", where they can then be edited or have batch functions performed on them. A modest collection of touch-up tools is bundled, including red-eye reduction, cropping and image enhancement. Power users can resize images for the Web via the export function.

Although these manipulation options are relatively basic, they're ample for most users, especially given that the application is free. Anyone seeking more advanced functionality can shell out for a dedicated image editing tool.

Users can also send "Hellos" at **http://hello.com**, where images are made available for friends and family to view and comment on. This feature is a time saver for those who don't want to cut HTML code and upload images via FTP.

Picasa's outstanding feature is its search functionality, especially speed. The search is narrowed down as each character is typed, and is complete by the time you've finished typing.

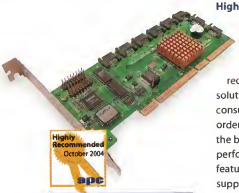
Some of the features found here, like red-eye reduction and rotating, will ship as standard with Windows Longhorn, but Picasa gives access to these functions in the meantime. And while it's geared towards new computer users, there's plenty here for the power user, too. As a free piece of software with outstanding features, expect to see Picasa become very popular very quickly.

Matthew Overington

Details

Contact	Picasa
Online	www.picasa.com/google
Price	Free
Intended market	Everyone
✔	Fast; stable; easy to use.
✖	Doesn't adhere to Windows UI models.
Verdict	★★★★½

Highpoint RocketRAID 1820



Highly Recommended
October 2004
apc

Highpoint makes adding RAID 5 support to a business machine affordable and easy.

While onboard RAID solutions are usually sufficient for home users, higher RAID levels require three or more drives, which puts such solutions beyond the reach of many domestic consumers. However, businesses require RAID 5 in order to give servers and high-end workstations the best balance between fault tolerance and performance. Highpoint's RocketRAID 1820 features eight SATA ports and can simultaneously support a number of arrays.

Several failsafe features make the RocketRAID 1820 ideal for critical apps. Assigning drives to a reserve pool allows the controller to rebuild any non-RAID 0 array upon drive failure. While the array is being rebuilt, data on the broken array is still accessible, albeit at a slower rate.

Management software for both Windows and Linux is included which allows you to create, remove and modify arrays. This software can also be installed on another PC, allowing for remote administration and management. A user management system assigns different levels of access controls to different users, and can also notify network administrators of notable events, including disk failure, by email.

Solid performance is a hallmark of the card. Even when used in a PCI slot, RAID 0 performance is comparable to onboard solutions — both the RocketRAID and Intel's ICH5 SATA RAID controllers produce a burst read rate approaching 100MB/s, with an average read rate of just over 40MB/s. One area where the RocketRAID jumps slightly ahead is CPU resource usage — it uses only 3.8% of resources from the test Pentium 4 3GHz CPU instead of the 7.1% consumed by Intel's chipset.

In RAID 5 solutions, the burst read rate in a three-drive configuration goes up to 118.6MB/s — a figure limited by the maximum speed of the PCI bus. The CPU is not penalised with such a configuration either — usage remains a low 3%.

A half-height back plate is included, allowing the card to be installed in 2RU servers or compact workstations, along with eight 50cm SATA cables. About the only thing missing is Mac support.

If you need RAID 5 and you've got a workstation with a PCI-X slot, this is a top buy. Even if you're limited to using the PCI bus, there are still performance benefits to be found.

Jarrod Spiga

Details

Contact	Altech Computers
Phone	(02) 9735 5655
Online	www.altech.com.au
Price	$330
Intended market	Enterprise; performance enthusiasts
✔	Price; failsafe and email notification features.
✖	No Mac support.
Verdict	★★★★☆

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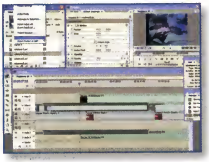
Adobe Video Collection 2.5 Pro

Adobe's long line of quality movie-making applications is now available in one big box.

Precise control: *After Effects' accurate colour control and RAM preview mean less time watching the hourglass spin and more time being creative.*



Room to move: *Premiere Pro 1.5 now works seamlessly with other professional video editing applications through EDL.*

Audio utility: *Audition 1.5 provides many audio tools not available in Premiere Pro.*

Details	
Contact	Adobe
Phone	1300 550 305
Online	www.adobe.com.au
Price	$2,999
Intended market	Business
✔	Improved Encore; HD and EDL support in Premiere Pro 1.5.
✖	Requires training — there are no wizards to help beginners.
Verdict	★★★★☆

Adobe has taken a pointer from Microsoft's successful Office strategy by offering all its video creation tools in one compelling package. Adobe Video Collection 2.5 Professional includes Premiere Pro 1.5, After Effects 6.5 Professional, Audition 1.5, Photoshop CS and Encore DVD 1.5. All the bundled applications are new releases, apart from Photoshop CS which has been available for several months. And each application has its own registration number, which should suit small studios with several workstations.

The Video Collection Standard version ($1,999) includes After Effects 6.5 Standard but omits Photoshop CS.

STUDIO IN A BOX

Adobe Premiere may have seemed like a professional video editing tool to many enthusiasts, but the lack of compatibility with high-end editing applications has kept it out of the top production studios.

However, new features such as Edit Decision List (EDL) support will undoubtedly make Premiere Pro 1.5 more appealing to professionals. It provides the ability to export and import edit information from timelines to apps from Avid, Discreet and Apple.

High Definition (HD) video support provides the tools to create 16:9 format video via HD camcorders.

Nested timelines allow you to perform a series of actions on a range of clips, a shortcut that can save serious editing time when working on large projects. Another workflow improvement stems from the inclusion of modifier keys that enable you to set Ctrl and Alt key combinations.

On the audio side, Premiere Pro allows you to zoom in on an audio section, making it easy to quickly isolate and remove anomalies such as crackles or hiss. The capacity to input live voice recording directly into a timeline is handy for documentary or interview videos.

ANOTHER ENCORE

Adobe has introduced some elements designed to enhance stability in Encore DVD 1.5, along with several new features to improve workflow with other Adobe applications.

Control over the user experience is essential if you want to create commercially distributed titles, and Encore DVD 1.5 allows you to disable or enable a viewer's remote control operations in specific sections of a DVD. For instance, you can force viewers to watch copyright notices for a certain length of time.

Chapter points from markers in AVI files created in Premiere Pro and After Effects can be integrated straight into the Encore timeline. This saves a lot of time as you can quickly determine how a DVD title will unfold while making cuts. Strong support for Photoshop CS also means layout and alignment decisions will be replicated exactly within an Encore menu panel.

Custom workspaces should also please DVD creators, allowing specific tasks to be saved for future projects, as well as preset window arrangements for repeat clients or repetitive jobs.

Encore DVD 1.5 doesn't really blow away competitors such as Ulead DVD Workshop 2 in terms of features, but will help streamline the workflow if used in conjunction with Premiere Pro and Photoshop CS.

GOING TO THE MOVIES

After Effects Professional 6.5 is the only Adobe product in the Video Collection that is used by major production studios around the world. It's also the only video-based Adobe app available for the Mac platform (Premiere, Encore DVD and Audition are only available for Windows XP).

A couple of noteworthy new features in this version include a cloning tool which replicates an area of a video (in much the same way as the stamp tool in Photoshop) and tighter integration with Encore, Premiere Pro and Photoshop CS.

Adobe recently purchased Cool Edit Pro audio editing software from Syntrillium and rebadged it as Audition 1.0, with virtually no input from the Adobe development team. Adobe-inspired features for Audition 1.5 include stronger support for Premiere project timelines and the ability to isolate particular frequencies to help remove extraneous noise, as well as support for the popular VST plug-in format. Sadly, the user interface lacks Adobe's typical look and feel.

At around $3,000, many video editors will find the Video Collection Professional package too good to resist. But if you're an existing Premiere Pro user and don't want to export your edit lists to other applications or work in HD video, wait until the next major release.

Denis Gallagher

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EXCEL G556

GRAPHICS BY ATi RADEON 9700

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apc EDITOR'S CHOICE MAR 2004

Picture this

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Intel® Dothan® Processor 2.0GHz
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30/40/60/80Gb HDD
DVD-RW
Windows XP Home Edition

G736
Intel® Pentium® 4 Processor 3.0GHz
128MB ATI Mobility Radeon 9600 graphic
256/512/1024 MB DDR SDRAM
15" TFT SXGA 1400x1050 display
30/40/60/80 GB HDD
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D490
Intel® Pentium® 4 Processor 3.2GHz
128MB ATI Mobility Radeon 9600 graphic
256/512/1024 MB DDR memory
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17" WXGA 1440x900 Display
Combo/DVD-RW drive
Windows XP Home Edition

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Intel® Pentium® M Processor 1.7GHz
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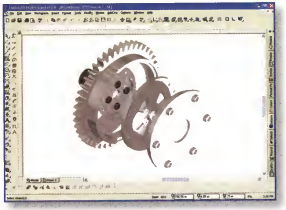
IMSI TurboCAD Professional 10

TurboCAD isn't just for engineers and architects, but you have to be prepared to learn the ropes.



Picture perfect: *TurboCAD Professional 10 renders objects well, but lighting adjustments may be needed for best results.*

Today's large displays and powerful CPUs put CAD within the reach of ordinary users planning home renovations, preparing drawings for engineers, or creating 3D images to incorporate into a presentation.

TurboCAD Professional 10 promises easy creation of 3D objects, photorealistic visualisation and improved architectural tools. Although it's aimed at serious CAD users, *APC* examined the program from the perspective of a power user, not a draughting professional.

The software is also available in Academic and Deluxe editions. The Academic edition is comprised of the full Professional package licensed for non-commercial use, plus a 2D CAD fundamentals course on CD-ROM certified by TAFE NSW. Users can enrol as distance students with TAFE NSW to gain certification.

TurboCAD Deluxe 10 is a simpler and cheaper alternative which includes a 10-day trial of the CAD course. The program itself lacks some of the Professional version's more sophisticated 3D features, including materials settings, support for multiple monitors, roofs (for architectural drawings), macro recorder and VBA support.

IN THE BOX

The Professional interface bristles with toolbars, tabs and other elements. Traditional engineering drawings of relatively simple objects — including plan, side and front elevations, and even isometric views — are easy to construct once you've found your way around the toolbars and menus. "Brief overviews" of the user interface and basic editing functions are enough to get you started, but the absence of any substantial tutorials handicaps the newcomer. The manual is comprehensive and well organised, but doesn't provide a tutorial.

The TurboCAD 2D and 3D Training Guides are essential for the new TurboCAD user and cost $130 for the pair ($75 individually). Even if your interest is 3D modelling, work through the 2D training to learn your way around the toolbars.

MODELLING

Primitive objects such as blocks and spheres can be added to or subtracted from each other to create more complex shapes. For architectural designs, floorplans can be laid out and then the walls given height (with different materials applied to either side). Alternatively, create the floorplan in the accompanying FloorPlan 3D app, then complete the job in TurboCAD.

A substantial library of symbols — covering furniture, electronic components, IT equipment and more — is provided on a second CD to save drawing everything from scratch. Objects within a model can be given custom properties (such as supplier or price), and can generate reports on quantities of certain hardware components required or bills of materials generated.

Three-dimensional models can be displayed in one of four ways: wireframe, hidden line removal, draft rendering and quality rendering. Each style comes with numerous options and the default settings are well chosen.

The appearance of an object also depends on the materials applied to its surfaces and the lighting selected. Backgrounds can be added to quality-rendered models. It's possible to create and edit items in a rendered view, but this requires a particularly fast computer — it's quicker and easier to work in wireframe or hidden line modes.

OUTPUT

Converting a 3D model into a conventional orthographic (front, side and plan) drawing is achieved by creating views of the model from the required sides, switching to "paper space", and creating a viewport corresponding to each view. The viewports can be arranged as desired and details such as labels and dimension lines added.

In addition to printed output, TurboCAD exports to a variety of file types including JPEG and EPS, plus specialised formats such as IGES, DWF and DXF.

The Publish to HTML feature outputs a JPEG file plus simple HTML code to display it, but when the current view is published rather than the entire model, the bounds don't match those displayed by TurboCAD and sometimes cause unattractive clipping at the edge of the model.

Producing accurate orthographic or isometric drawings is easy in TurboCAD, but the Professional edition is overkill if that's all you need. The Pro version comes into its own for complex 3D modelling with high-quality rendering and easy conversion into 2D drawings, but the more casual user can get by with the Deluxe version.

Stephen Withers

AutoCAD

http://south-apac.autodesk.com

Probably the best-known CAD package, AutoCAD is also available in versions for electrical and mechanical design. Training is widely available at TAFE colleges and other institutions.

CADView/7

http://fastcad.com/n-view7d.html

Perhaps you don't create drawings, but you do need to display or print other people's work. CADView/7 does that job for DXF and DWG files.

Details

Contact	Mindscape
Phone	(02) 9964 0475
Online	www.imsi.com.au
Price	Professional, $980; Academic Edition, $299; TurboCAD Deluxe, $199.95.
Intended market	Prosumer
✔	Feature-rich 2D/3D CAD.
✖	Training guides are expensive extras.
Verdict	★★★☆☆

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mediaRECOVER recovery software

Like a recycle bin for your memory cards, mediaRECOVER is an invaluable tool for reviving deleted, corrupted or formatted image files.

A momentary lapse of concentration is all it takes to send a valuable file to an untimely end. Fortunately, the Windows Recycle Bin offers a level of protection from erasing files by accident. However, it's helpless when it comes to removable media.

MediaRECOVER is specifically designed to "undelete" image files you may have binned by mistake, and can also recover formatted and corrupted files. While it can restore data deleted from the hard disk, mediaRECOVER is best used for removable media, including memory cards, USB keys, PC Cards and Zip and floppy disks. Recoverable image types include JPEG, EXIF, TIFF, PNG, GIF, BMP and RAW images, as well as AVI, MOV and MPEG files, but not MP3.

The software has a simple interface and a wizard to guide you through the steps of using the Recovery tool. You can choose a deep scan, which examines disk clusters for formatted or corrupted images, or a quick scan, which pulls up deleted files. The Format tool is used to condition a disk or memory card for recovery if it comes up as corrupt, unable to initialise or otherwise not mountable. You can also use mediaRECOVER to permanently wipe a disk.

In testing, mediaRECOVER has little trouble retrieving lost files saved on a USB key, as well as a SD memory card. Even a full format doesn't stop it finding the images again. A memory card was removed during the transfer of a large image, but mediaRECOVER was able to remount the drive and find a truncated version of the file.

The main criticism of mediaRECOVER is that it will only identify memory cards that are mountable. MediaRECOVER simply can't see cameras, PDAs, Smartphones and other memory card-equipped devices that don't appear as removable disks to Windows.

Despite this shortcoming, $49.95 is a small price to pay if mediaRECOVER retrieves a photo that means a lot to you. It's also available for Mac OS X, but check to ensure that your memory cards are mountable before you buy.

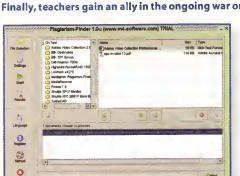
Valens Quinn

Details

Contact	Manaccom
Phone	(07) 3720 5555
Online	www.manaccom.com.au
Price	$49.95
Intended market	Everyone
✔	An easy way to recover images.
✖	Can't recognise memory cards not seen as drives.
Verdict	★★★½☆

Mediaphor Plagiarism-Finder 1.0.9

Finally, teachers gain an ally in the ongoing war on plagiarism.



For years, teachers have been fighting plagiarism, but with the advent of the Internet, the battle seemed lost forever.

German software house Mediaphor is turning the tables on would-be cheats with Plagiarism-Finder, a program designed to scour online articles for designated quotes and snippets. The application runs on every version of Windows from 98 through to 2003 Server and is invaluable for anyone marking students' work, as well as anyone looking to ensure that none of their work has been reproduced illegally online.

Plagiarism-Finder has the ability to search through a wide range of file formats, including Microsoft Word (DOC), Rich Text Format (RTF), Adobe Acrobat (PDF) and HTML. Support for spreadsheets, PowerPoint and programming code would really round out the package's usefulness.

Users can choose to search on a number of criteria ranging from a random sampling of text, through to a complete examination. A customised level is also available for users wanting to tailor their search requests.

APC tested the software by taking some quotes from articles published at a number of news sites, as well as **www.apcmag.com**. The software correctly identified the origin of each sample excerpt and in some instances a number of matches were confirmed. Mostly this occurred when content had been syndicated across a number of publications, though it could also be useful in identifying often-copied passages.

Sample tests took between 60 seconds and 35 minutes, depending on the speed of the Internet connection and the complexity of the request. The quick searches lack detailed information.

For anyone earning a living as a writer or editor, Plagiarism-Finder will pay for itself in no time. A 30-day trial is available for potential users looking to give the software a test run before committing to the US$125 purchase price.

There's no doubt that the Internet has been a boon to anyone seeking to pass off the work of others as their own. This application enables the good guys to fight back.

Matthew Overington

Details

Contact	Mediaphor
Online	www.m4-software.com
Price	Free 30-day trial; US$125 to buy
Intended market	Everyone
✔	Effective search system.
✖	Some search requests are slow.
Verdict	★★★½☆

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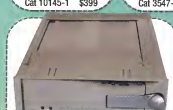
MicroGrams USB Net Phone is designed to make free PC to PC calls over the Internet. With its slim design it is a perfect solution for home, SOHO and traveling users. No software is supplied with the phone, however MicroGram recommends using Skype, which is free to download from www.skype.com. Other programs like MSN Messenger, NetMeeting, Yahoo Messenger, and ICQ are also compatible.
Skype 1.0 now supports "SkypeOut" a feature that allows users to make calls to friends who only have a landline or mobile phone, anywhere in the world at local rates.
Cat 10129-1 $89



Removable HDD Kit

Kit includes aluminium tray and frame for IDE Hard Disks.
Cat 6802-1 $79

Gigabit PCI Adapter

Add a high speed gigabit port to your PC with this inexpensive 1000/100/10Mbps NIC.
Cat 11359-1 $41

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A two way KVM switch for use with a DVI monitor and PS/2 mouse and keyboard.
Cat 11663-1 $169

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Cat 11666-1 $105

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This optical switch box has three inputs and one output.
Cat 23000-1 $54

SATA Controller

Add two SATA Hard Disks to any PC.
Cat 2872-1 $99

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Comes with cutter and software
Cat 5448-1 $249

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Cat 1008039-1 $399

Serial to Ethernet

Available in 1, 2, 4 or 8 port models
Cat 15141-1 (single port) $259

12v Mini PC

This Mini PC is perfect for the car, boat or even the office.
Cat 1150-1 $729

TV on your Monitor

Watch TV on any monitor. Does not require a PC.
Cat 3525-1 $239

USB to 2 Serial Ports

Provides two native windows COM ports that are compatible with Windows serial communication applications.
Cat 2852-1 $119

wLAN USB Dongle

This 802.11b dongle is great for setting up a simple wireless network.
Cat 11438-1 $69

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SHORE AD/MGRAM1/OA

NetComm Mobile VPN Firewall

Simple, straightforward office connectivity for when you're on the road.

NetComm's Mobile VPN Firewall is a US8 network dongle aimed at corporate travellers who need to establish VPN connections quickly and securely from a range of potentially hostile networks.

Installation is as simple as connecting the US8 cable to your PC and plugging a Cat5 lead into the adaptor. Windows quickly detects the device and then asks for the driver CD. Considering the driver files are less than 32K8, they really should have been included on the flash memory.

Once installed, a valid private IP address is automatically assigned. Further configuration is performed through a rudimentary Web interface.

A variety of different WAN connections are supported, including PPPoE, DHCP, static IP and Cable Heartbeat. However, the Mobile VPN Firewall's MAC address can't be changed and PPPoA connections aren't supported.

Up to five different IPSec tunnels can be configured and connected simultaneously. Each tunnel can support both DES and 3DES encryption and use MD5 or SHA authentication hashes of 768-bit or 1,024-bit key lengths. Key management can be specified manually or automatically dealt with through the Internet Key Exchange (IKE).

Ultimately, the restricting features of the device hamper its usability. You can't employ it to establish CIPE, Open VPN or native PPTP VPNs. No ports can be specified to accept incoming connections on, nor does the firewall support UPnP — making it impossible to accept inbound connections, even if you wanted to. A maximum of 10 URLs can be blocked by the firewall and only Windows operating systems are supported.

Generally, IPSec tunnels can't be established through NAT gateways. This is because IPSec performs integrity checks over the entire packet at the endpoints, detects that NAT has modified the TCP/UDP headers and discards the packet. With the limited tests able to be run in the *APC* Labs, a secure tunnel was set up with no additional configuration. A NetComm product engineer advised that no NAT gateway should prevent VPN connections from being made.

If you want the convenience of plug-and-play VPN access, NetComm's Mobile VPN Firewall is a handy device. Just don't expect too much in the way of flexibility.

Jarrod Spiga

Details

Contact	NetComm
Phone	(02) 9424 2070
Online	www.netcomm.com.au
Price	$169
Intended market	Enterprise
✔	Easy and convenient VPN connectivity.
✖	Elementary firewall features.
Verdict	★★½☆☆

Pioneer DVR-A08XLR Double Layer DVD writer

The DVD writer speed race is on, and Pioneer has set the pace with a new 16x sprinter.

With the A08XLR, Pioneer has upped the DVD burning ante, adding support for 16x burning with both DVD+R and DVD-R. However, the best feature of this drive is its Double Layer (DL) speed. The ability to burn a DL DVD+R disc at 4x reduces the waiting time from over 45 minutes to just 27.

Supporting DVD±R writing at 16x, DVD±RW writing at 4x, as well as CD-R and CD-RW at 32x and 24x respectively, the A08 is a screamer. The A08XLR writes an 8x Maxell DVD-R disc in six minutes and 44 seconds at an average speed of 10.13x. The slow average is due to the use of Z-CLV (Constant Linear Velocity) technology, which periodically increases the burn speed up to the maximum supported.

Testing shows the unit only writes the disc at 16x for less than five seconds at the end of a 4.7G8 test burn. This is slower than drives burning at 12x in CAV (Constant Angular Velocity) mode.

CD burn tests clock the drive at 24.92x, taking three minutes and 47 seconds to fill a 700M8 test disc. This result is on par with other writers on the market, but the drive really leaps ahead in DVD+R DL writing. Though a jump from 2.4x to 4x doesn't sound like a great deal on paper, it saves over 10 minutes per disc in practice.

A full 8.5G8 DVD+R DL (Verbatim 2.4x rated) disc is written in 27 minutes and two seconds at an average speed of 3.99x — an excellent result. Although the media doesn't specifically support writing at 4x, testing indicates that a number of the 2.4x-rated discs are capable of sustaining writing at 4x.

The Pioneer DVR-A08XLR is packaged with Nero Suite OEM version 3, which includes Nero Express, InCD and NeroVision, plus Ulead's DVD MovieFactory 3.5SE. Pioneer also bunde an 8x DVD-R and a 4x DVD-RW to get you started.

Clearly, the Pioneer DVR-A08XLR is a very good piece of hardware. If DL burning is what you're after, you can't go past the A08XLR for ultra-quick performance. However, if your primary requirement is to write single layer media as fast as possible, consider a high-end 12x drive that burns in CAV such as the Plextor PX-712A (see "Extreme DVD", page 93).

Nick Race

Details

Contact	Pioneer
Online	www.pioneeraus.com.au
Phone	1300 666 383
Price	$329
Intended market	Performance enthusiasts
✔	Excellent 4x DL support; software package.
✖	16x isn't all it's cracked up to be.
Verdict	★★★½☆

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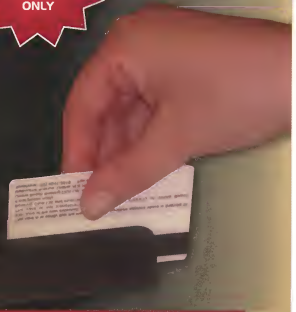

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Desktop replacement notebooks

***Matthew Overington* examines three notebooks that shine when performance matters more than portability.**

The majority of notebooks available are marketed towards business buyers, but the reality is that portables have become extremely popular as consumer devices.

Most people use notebooks for work, playing DVDs, and even a little gaming. But while thin and light machines are ideal for busy executives, they're inadequate for most multimedia apps.

These desktop replacement notebooks are suited to buyers who want the ultimate in power and don't mind lugging around a little extra weight.

Because desknotes are built on desktop components, they are cheaper than lighter machines which rely on purpose-built hardware. Extremely powerful, fast systems are available for less than $3,000 with a large hard disk, 3GHz Pentium 4 processor and 512MB of RAM. If you favour power over portability, any of these machines will serve you well.

Dell Inspiron 9100

Dell's Inspiron 9100 features a massive 2GB of RAM, 60GB hard disk and a 3.4GHz Pentium 4 processor. These components help drive the 9100 to 19.5 under Business Winstone 2004 and 26 in Multimedia Content Creation Winstone 2004.

It falls down under battery testing, managing just under two hours under BatteryMark.

A Radeon Mobility 9700 offers near-desktop video performance. The 15.4in screen, running at a native resolution of 1,900 x 1,200 pixels, offers clear, crisp images.

The 9100's three large internal fans run quietly and cool efficiently. It weighs 4kg, but is great for multimedia apps. Support for 802.11a/b/g wireless and Bluetooth come standard, as does a one-year warranty.

Details

Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	$3,799
✔	Powerful; good graphics.
✖	Battery life.
Verdict	★★★½☆

IBM ThinkPad G40

IBM's G40 is based on a 3GHz Pentium 4 processor, 512MB of RAM and a 60GB hard disk. A Business Winstone 2004 score of 14.6 is matched by a Multimedia Content Creation mark of 19.9. Bluetooth and 802.11g wireless support are bundled, as is a Teac DVD/CD-RW combo drive.

A native screen resolution of 1,400 x 1,050 pixels is offered by the onboard video controller. Video performance is adequate for DVD playback, but the 4:3 aspect ratio is disappointing.

Although the machine weighs just over 4kg, the Thinkpad G40 tops two hours and 40 minutes in BatteryMark testing, which is an outstanding result for a desktop replacement.

Details

Contact	IBM
Phone	1800 249 426
Online	www.ibm.com.au
Price	$2,749
✔	Battery life.
✖	Onboard video.
Verdict	★★★½☆

Toshiba Satellite P20

Toshiba's Satellite P20 features a 3.4GHz Pentium 4 processor, 1GB of RAM and an 80GB hard disk. The notebook weighs 4.3kg and is comfortable to type on. It manages two hours and 26 minutes under BatteryMark — an excellent result. A GeForce FX Go5700 processor, 17in wide-screen display, Harman Kardon speakers, a remote control, FireWire and USB 2.0 ports are all present. Gigabit LAN and 802.11g Wi-Fi and Bluetooth are available and a Matshita DVD writer offers optical storage.

The system achieves 19.1 under Business Winstone 2004, and 19.5 under Multimedia Content Creation Winstone 2004.

At $5,499 it's not cheap, but is considerably future-proofed.

Details

Contact	Toshiba
Phone	13 30 70
Online	www.isd.toshiba.com.au
Price	$5,499
✔	Superb video and audio.
✖	Heavy.
Verdict	★★★★☆

Mobile Media Center

One of the big drivers for desknote purchases will come later this year with the introduction of Windows XP Media Center Edition 2004 to the local market. Tier-one vendors are already marketing wide-screen notebooks bundled with TV tuner cards, remote controls and a copy of Microsoft's lounge room OS overseas, so it's only a matter of time before they reach local shores.

Several are already available in the US, including Toshiba's Qosimio line of purpose-built Media Center notebooks. The Qosimio is designed to enable users to quickly view DVDs or TV without booting to a full OS. HP is offering Media Center 2004 on its Pavilion zd7000 wide-screen desktop replacement overseas, while Dell's Media Center competitor, Media Experience, comes pre-installed on its Inspiron notebooks.

Microsoft is yet to officially announce which vendors will be offering Media Center on portables in Australia.

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Small form factor PCs

Mini PCs offer the ultimate blend of style and power.

***Nick Race* looks at four small form factor barebones kits.**

Small form factor (SFF) systems have been selling like hotcakes as they're small, stylish boxes that don't look out of place on a desk or in a lounge room.

There are disadvantages with these small systems, as some models can't accommodate more than one hard drive, thus missing out on RAID functionality. Extra storage may also be an issue. Most only have room for one optical drive, reducing an expensive DVD burner's lifespan.

Historically, choosing components for SFF boxes has required a lot of research, as many wouldn't accept top-end video cards or full-length PCI cards. Today's models are more forgiving, but check the dimensions of any cards before buying.

All units reviewed here are Pentium 4-based, and ship with the case, power supply and motherboard. AMD-based barebones units are also available to fit Athlon XP or 64 CPUs.

ABIT DigiDice

The DigiDice is a little different to other small form factor boxes, being more of a blend of desktop and mini PC.

The box incorporates a dial capable of overclocking the machine when required. In practice, however, it amounts to a gimmick.

The DigiDice is a capable system built on the i865 chipset. It has room for two optical drives, two 3.5in drives and a built-in 6-in-1 card reader.

It ships with InterVideo WinCinema and WinRip, both of which work with keyboard-like quick start buttons.

Benchmarks of 3,574 under PCMark04 and 19.5 under Business Winstone 2004 are acceptable.

Details

Contact	Altech Computers
Phone	(02) 9735 5655
Online	www.altech.com.au
Price	$310
✔	Room for multiple hard drives.
✖	Gimmicky overclocking dial.
Verdict	★★★☆☆

AOpen XC Cube AV EA65

AOpen's EA65 is specifically built for home theatre and AV purposes. The front of the unit features VCR-style control buttons, along with the usual USB and FireWire connectors. It's built on the Intel 865G chipset, with support for Pentium 4 processors up to 3.4GHz.

The system is bundled with InterVideo Home Theater software and a remote control. It also utilises Intel's InstantOn technology, which reduces the time it takes to boot the machine by placing it in hibernation mode.

Scores of 3,699 in PCMark04, 27.5 in Multimedia Winstone 2004 and 21.2 in Business Winstone 2004 show the EA65 is no slouch when it comes to performance.

Details

Contact	BlueChip Infotech
Phone	1800 803 802
Online	http://asia.aopen.com.tw
Price	$710
✔	HTPC functionality and software.
✖	Only fits one hard drive and one optical drive.
Verdict	★★★★½

Shuttle XPC Zen ST62K

The smallest unit in this roundup, the Zen forgoes a typical internal power supply for an external power brick. It offers support for Intel Pentium 4 processors up to 3.4GHz, one hard drive, one optical drive and either a floppy drive or 6-in-1 card reader. A single PCI slot is available.

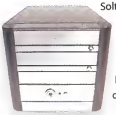
Shuttle has utilised ATI's RS300 chipset with integrated Radeon 9100 graphics. Though unable to be upgraded, this system is superior in performance to the Intel Extreme Graphics 2 found on the other boxes tested.

A PCMark04 score of 4,048 and Multimedia and Business Winstone results of 25.6 and 19.8 respectively show the Zen is ideal in a home entertainment setup.

Details

Contact	Sato Technology
Phone	(02) 9748 2999
Online	www.satotech.com.au
Price	$599
✔	Ultra-quiet; good performance.
✖	Minimal expandability; no AGP.
Verdict	★★★★☆

Soltek QBIC EQ3401M

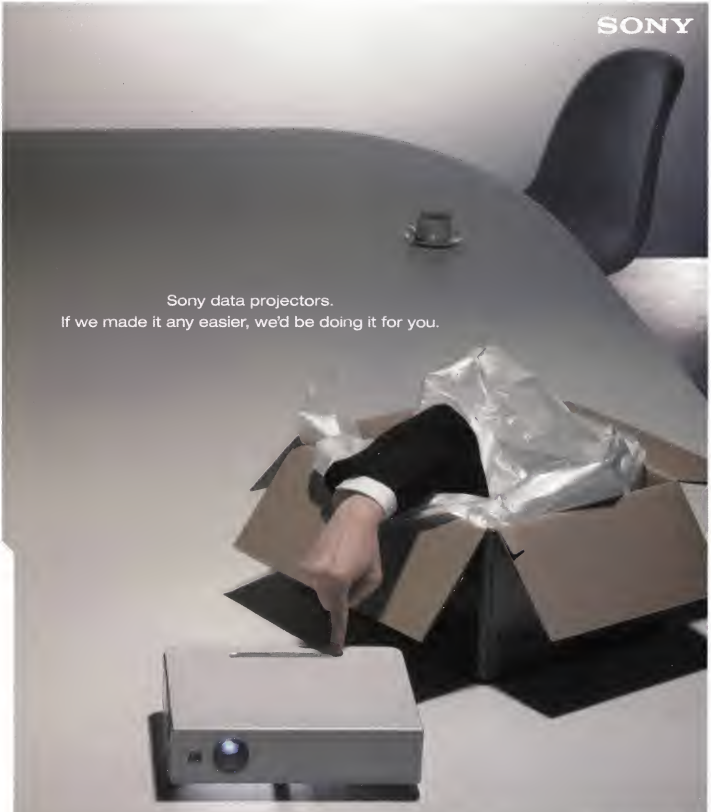


Soltek's EQ3401M is based on the Intel i865 chipset, allowing Pentium 4 support up to 3.4GHz and two DDR slots. An 8x AGP and single PCI slot are available, while the Intel Extreme Graphics 2 chipset provides entry-level graphics. There's room for a 3.5in hard drive, a floppy and two optical drives. The front panel holds two USB 2.0 ports, FireWire, plus headphone out, mic in and optical out for audio. PC-cillin, VirtualDrive 7, RestoreIT! 3 Lite, Partition Magic 6.0 SE and Drive Image 4 are bundled.

Its 3GHz Pentium 4 processor and 512MB of DDR400 help it score 3,691 in PCMark04, 26.1 in Multimedia Content Creation 2004 and 20.2 in Business Winstone 2004.

Details

Contact	Altech Computers
Phone	(02) 9735 5655
Online	www.altech.com.au
Price	$380
✔	Excellent software package.
✖	Only room for one hard drive.
Verdict	★★★½☆



Sony's stylish and compact projectors put perfect presentations well within your grasp. Just turn it on, and the auto set-up feature ensures lens cover retraction, height adjustment, input selection, pixel alignment and digital keystone correction. So now you can look good before you've even started your presentation. For more information on Sony's easy-to-use projector range, see your nearest dealer, call 1300 13 SONY or visit us at sony.com.au

IT'S A SONY

SONY DISPLAY

Lexar™

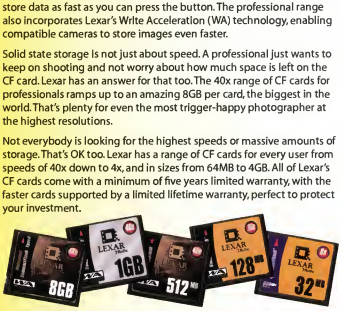
Lexar storage has size and speed on its side

Lexar designs digital storage devices that get the ultimate performance out of your digital cameras or consumer devices. The products include the most popular formats such as CompactFlash™, SmartMedia™, MultiMediaCards™, Secure Digital™ cards, xD-Picture Cards™ and Memory Stick™.

What sets Lexar apart are the speed features it builds into its technology. Catering for the professional and power user, the Pro line of CompactFlash (CF) cards can record data at up to 80x, or a whopping 12Mbit/s. With speed like this, even multi-megapixel digital cameras will store data as fast as you can press the button. The professional range also incorporates Lexar's Write Acceleration (WA) technology, enabling compatible cameras to store images even faster.

Solid state storage is not just about speed. A professional just wants to keep on shooting and not worry about how much space is left on the CF card. Lexar has an answer for that too. The 40x range of CF cards for professionals ramps up to an amazing 8GB per card, the biggest in the world. That's plenty for even the most trigger-happy photographer at the highest resolutions.

Not everybody is looking for the highest speeds or massive amounts of storage. That's OK too. Lexar has a range of CF cards for every user from speeds of 40x down to 4x, and in sizes from 64MB to 4GB. All of Lexar's CF cards come with a minimum of five years limited warranty, with the faster cards supported by a limited lifetime warranty, perfect to protect your investment.



Not all cameras and devices use CompactFlash, and CompactFlash isn't all that Lexar creates. Lexar MultiMediaCards are the small, convenient and durable data storage solution for use in a variety of digital applications. These small yet powerful media cards are designed to interface with an array of digital devices designed to support the MultiMedia and Secure Digital card format, including PDAs, cellular phones, digital video recorders and digital cameras. Lexar's MultiMediaCards come in a range of capacities to suit your storage needs.

Secure Digital (SD) is becoming more and more common in mobile phones, PDAs, MP3 players and digital cameras. Lexar has stepped up to the plate with its range of standard and high-speed SD cards for every use. Standard cards are available in 64MB to 256MB models. Speed is important, especially to a power user. Lexar has a range of high-speed 32x SD cards in sizes from 256MB to a roomy 1GB. Get snapping!

Most digital appliances, including Sony's MP3 audio recorder, rely on the Lexar Memory Stick format for getting data on and off the device. Being locked into a one-vendor solution can be a nightmare at times. Thankfully, Lexar also make a range of Memory Sticks in the standard format, plus the Duo and PRO range.

Lexar's standard Memory Sticks come in a range of sizes from 64MB up to 256MB, the perfect companions for your Sony digital camera. In the Duo range, Lexar's memory sticks are available in 64MB and 128MB. With built in MagicGate DRM compatibility, protecting commercially valuable digital images or music is easy.

For advanced users, Lexar's range of Memory Stick PRO cards is available from 256MB to a spacious 1GB. Also available in the PRO range is the Duo-enabled storage cards, offering MagicGate™ support in 256MB and 512MB capacities.

Lexar's Memory Stick also lights up when data is being written to it by your device, avoiding any unintended loss of data.

Lexar has also played it smart with its range of SmartMedia storage cards, which are available in sizes of 64MB or 128MB. Your digital camera will love the speed available when storing high-quality digital pictures.

The range of xD-Picture Cards for Olympus' digital camera family manages to squeeze fast and reliable storage into a miniscule size, and are available up to 512MB. Using your Olympus camera's advanced functions, such as panorama mode, is fully supported.

Lexar's stable of digital media cards and accessories can perfectly complement your digital devices. Even professionals can find ultra-quick results, increased data reliability and a lifetime warranty to suit the demanding nature of their requirements.

www.lexarmedia.com.au

brother At your side.

Fast colour laser printers are here

With a tradition of manufacturing high-quality business and consumer level printers and Multi-Function Centres® (MFCs®), Brother has now created the HL-2700CN colour laser printer for businesses.

Back in the old days, laser printers were expensive to buy and run. Only businesses that could truly justify the expense of a colour laser owned a machine. Today, high-quality colour laser printing is accessible to a much wider range of businesses and individuals. Adding colour and life to documents, graphs, charts and key points in that all-important report is now the norm. Brother's range of colour laser printers are the ideal tools to enhance business communications, and include the HL-2700CN network colour laser printer.

The HL-2700CN produces the clear, high-quality results that only a laser printer can bring to your business. Outputting full-colour laser prints at up to eight pages per minute for colour means staff won't be standing around waiting for their printouts. The HL-2700CN can also print in black and white at 31 pages per minute, making it an ideal replacement for your current workgroup laser printer, with the added benefit of clear and crisp colour output.

That clear output comes from the printer's 2,400 x 600 dpi printing resolution. This will ensure that all your documents are printed accurately and have a professional finish when presentation is paramount.

Speed isn't the only benefit of the HL-2700CN, which has a wide range of accessories such as memory enhancements, built-in fonts and barcodes. Add the paper handling options that allow duplexing and large paper trays, and the HL-2700CN can grow with your requirements. Supplied as standard with a 250-sheet tray, the HL-2700CN offers expansion up to 780 sheets, reducing the hassle of replacing paper when you're in a rush.

Front-accessible toner replacement makes changing the unit's consumables fast and easy. Combined with the user-friendly printer software, even the most technically naive employee will be able to keep the HL-2700CN up and running, putting less of a burden on IT resources.

With a base memory of 64MB, upgradable to a whopping 576MB, the HL-2700CN will print even the most complex document in no time. Do away with a standalone print server with the HL-2700CN's built-in 100baseTX Ethernet network card. The printer's Ethernet card means print jobs are transferred to the HL-2700CN quickly and with a minimum of fuss.

Brother's HL-2700CN printer comes with an excellent pedigree. Supporting PCL6, PCL5C and Br-Script3 PostScript Level 3 Language Emulation, it prints standard-based text and documents in Windows or Macintosh network environments with ease.

The printer is shipped with comprehensive and powerful network management software, taking further stress off harried IT staff who can administer the machine from their desks. This is especially beneficial for larger networked environments, or off-site support where getting hands on a piece of equipment can be difficult or time consuming.

Ringing an internal IT department is a luxury not every business has. The high cost of bringing a consultant or technician onsite to fix a small problem can be a nightmare to smaller businesses. Brother runs a help desk service for their range of printers, and getting help with your colour laser is just a phone call away. Combined with a national network of trained technicians, the help desk will ensure your printer Is always up and running.

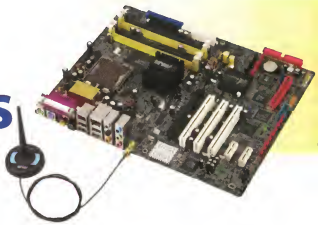
If there's no hurry, or if you prefer a hands-on approach, help and troubleshooting information is also available on Brother's support Web site at **http://solutions.brother.com**.

For a printer, it all comes down to print quality, speed and reliability. Brother's HL-2700CN colour laser printer has these in bucket loads. With crystal clear colour prints at 2,400 x 600 dpi, up to 31 pages per minute in black & white and eight pages per minute in colour, plus support at your fingertips, you can't go wrong. The best part is the price tag. At $1,399 there's no barrier to adding a little colour to your business.

www.brother.com.au

Speed Section

ASUS P5 motherboards take the lead



To take advantage of the speed boosts in the new PC architecture, it's important to find a motherboard engineered from the ground up for performance.

It's an exciting time in the PC industry: Intel's new higher-performance processors are out, and both the PCI Express bus and DDR2 RAM are offering unprecedented system bandwidth.

But all motherboards are not made the same – it's worth doing a little research before buying a board based on marketing claims alone.

ASUS' new P5 motherboards deliver impressive performance, and are ready for Intel's next-generation CPU, based on the LGA775 socket (which flips CPU sockets on their head, with pins on the motherboard and connector pads on the CPU).

Intel is pushing out the new CPU architecture aggressively, pricing LGA775-based chips at about the same levels as the old Socket 478-based processors as an enticement for end users and the industry to make the leap quickly.

PCI Express (PCIe) is fully integrated into every P5 board. On the midrange and high-end models, multiple PCIe X1 slots offer 250MB of bandwidth in each direction per channel, compared to the tardy 133MB shared bus speed of PCI. On models that offer it, the PCIe X16 slot gives video cards a massive bandwidth of up to 4Gbit/s, up from the 2.1Gbit/s speed of AGP 8X.

ASUS engineers have also squeezed extra performance out of Intel's 915 chipset by unlocking Intel's maximum 533MHz memory bandwidth to a full 600MHz DDR2 RAM bandwidth.

There's also an obvious focus on high-performance networking with Gigabit Ethernet on all models except the most basic board. In the Premium models, ASUS also has the industry's first integrated 802.11g wireless networking, along with dual Gigabit Ethernet ports. One of the two ports sits on the new PCI Express bus, allowing for substantially greater Ethernet performance than older boards that ran the port through the 133MB/s shared PCI bus.

Connectivity takes full advantage of Intel's new PC architecture. In addition to the now-standard complement of eight USB 2.0 ports, the Deluxe variants come with 400Mbit/s FireWire for connection of digital video cameras. The Premium models also have blisteringly fast 800Mbit/s FireWire for connection to external hard drives.

If you're after the maximum speed possible for external hard drives, the Premium motherboards also come with PCI brackets that have external Serial ATA (SATA) connectors, allowing you to run a drive external to the PC with absolutely no performance penalty.

On most models, there are multiple RAID controllers. On the top model, for instance, there's SATA RAID built into the Southbridge, a PCI SATA RAID controller and a PCI Parallel ATA RAID controller for backward compatibility.

The P5 motherboards also come with stunning eight channel high-definition sound for 7.1 surround gaming or home theatre.

Where the P5 boards clearly stand out from the competition is the range of ASUS exclusive technologies developed to help enthusiasts optimise their systems.

The fanless motherboard is the dream of most PC users. ASUS has developed a heat spreader called "Stack Cool" that takes the place of noisy fans, conducting heat away from high-temperature transistors and large capacitors on the motherboard, reducing heat by a full 10 degrees.

There's also a WiFi setup wizard, which makes the normally tedious process of setting up a wireless network straightforward. With a couple of clicks, you can set up the wireless network ID, WEP encryption and pick the best transmission channel automatically. Then, the wizard will set up Microsoft Internet Connection Sharing to allow you to connect other PCs rapidly.

A fascinating new feature is AI NOS (no-delay overclocking system), which allows you to safely overclock your PC without rebooting. The system constantly watches system load, and if you're coming close to CPU capacity, overclocks dynamically to get extra performance.

AI NET2 allows you to diagnose your network connection before booting into your operating system. You can also see exactly where a cable fault lies; for example, the Virtual Cable Tester can tell you that the cable is failing 8.13M from your PC.

The upshot of all these features? ASUS' P5 motherboards are a great buy. They're packed with features and performance-boosting technologies that will let you make the most of the industry's latest PC architectures.

Double-layer burning hits speed records

ASUS has released a double-layer DVD burner that can write four hours of video in less than half an hour.

Double-layer DVD burning is great in concept: the huge capacity makes storing uncompressed DVD movies easy, but what's the point if they take two hours to burn?

ASUS' latest multiformat DVD writer, the DRW-1604P, breaks through the speed barriers that first-generation double-layer burners suffered, now offering the industry's leading speeds.

It records double-layer (DL) discs at 4x speed, allowing 8.5GB of data (four hours of DVD-quality video) to be written in around 25 minutes.

Single-layer discs (both DVD+R and DVD–R) write at 16x speed, allowing a full disc burn in less than seven minutes. And, unlike earlier DVD burners, CDs don't take a speed hit either: the DRW-1604P can write to CD-R at 32x.

Availability of media is an ongoing problem, with the hardware industry constantly leapfrogging media manufacturers in the speed stakes. ASUS has solved this problem by building overspeed burning right into its drives. ASUS engineers have thoroughly tested which 8x single-layer media can be safely burned at 16x (and likewise, 4x to 8x and so on).

The same applies with DL media, and many brands of 2.4x DL media can be safely burned at 4x. Having this functionality built into the drive takes the guesswork out of overspeed burning, and removes the need to do dangerous firmware hacks.

Importantly, ASUS' dual-compatibility feature creates dual-layer DVDs that can be played or read by most DVD-ROM drives and DVD players.

There are also a number of ASUS technologies that will make your burns more reliable. FlextraLink, ASUS' optimised buffer underrun prevention technology, prevents discs from being turned into coasters if your computer momentarily stops sending data.

But you probably won't need FlextraLink very often, as the DMA-66 interface of the DRW-1604P is twice the speed of most other drives, which are still running at DMA-33. DMA-66 feeds the drive with data at the maximum speed possible over the PCI bus, allowing the drive's inbuilt 2MB buffer to be kept full at all times.

The Double Dynamic Suspension System II (DDSSII) provides a second layer of suspension cushioning for the recordable media, dramatically cutting vibration from the spindle motor, and resonance between components in the drive as well as the PC case. DDSSII makes tracking and focusing even more precise, improving burn quality markedly.

The most revolutionary feature of the drive is the Liquid Crystal Tilt (LCT) laser technology, which instantly and constantly adjusts the laser angle for both reading and writing, overcoming slightly uneven disc surfaces and curvature often found in recordable media. Only the most expensive media has close to ideal flatness, so LCT allows you to use different brands of media without worrying about checking their reputation for perfect flatness first.

The benefits of LCT can be easily seen. Often overlooked as a buying criteria, error correction quality on the DRW-1604P is simply extraordinary. Specialist optical drive and media testing site CDRInfo said: "The drive showed a remarkable ability to correct errors and reached the 5th level with 3/5 score – that is one of the best performances we have ever seen from a PC drive."

Finally, ASUS FlextraSpeed (Flexible and Strategic Speed Switch Technology) always chooses the best recording speed for the media you're writing to. It effectively lowers operation noise, prolongs motor life and saves CPU resources.

The bundled Nero Express burning software provides the industry's leading burning solution, rather than the limited offerings created in-house by some optical drive makers. It provides a straightforward and reliable interface for burning data, music, videos/pictures, an entire disc, or a disc image.

If you're looking for the best burning performance, you won't find a better drive than ASUS DRW-1604P. You'll be hard pressed to find another drive with 16x DVD+R, 16x DVD-R and 4x DVD+R DL in one drive, coupled with technologies that allow you to burn with exceptional data integrity.

Water-cooling kits

On the cover CD

How we tested

All kits were installed on an Athlon 2B00+ CPU on a Leadtek K7NCR1BD Pro 2 motherboard. Units with adjustable fan speeds were run at maximum. Temperatures were monitored and logged by Motherboard Monitor 5.3.7.0, (on this month's cover CD set).

Each kit was run for 30 minutes with the CPU idle until the temperature stabilised, except in the case of the Zalman Reserator 1, which ran for one hour before the temperature was steady. The processor was then run at full load until the temperature stabilised. The ambient temperature in the *APC* Labs was a constant 20°C.

Water-cooling is the ultimate way to eliminate heat from a machine. *Nick Race* installs and tests seven kits designed to help your PC chill out.

Traditionally, the integration of water-cooling into computer systems was restricted to the overclocker market. The biggest enemy of running a computer outside of its specification is heat, so the adoption of water-cooling by those who push PC technology to its limits is no surprise. But these days, CPU temperatures rise with every generation of chip. Using closed water circulation cooling kits to move heat away from hot processor cores and into a radiator where it can be cooled quietly and effectively is the way of the future.

The faster a fan spins, the louder and more high-pitched it becomes. Space is limited in the areas of a PC where most of the heat is generated (the CPU, power supply and graphics card), so fans are driven at higher speeds to keep the temperature down. Water-cooling avoids this problem by transferring heat to an area where it can be cooled with larger and quieter fans.

Sony was the first to adopt this technology in a mainstream desktop computer, though Apple recently claimed that water-cooling was first used in its Power Mac dual G4 2.5GHz system as a fan-free solution to controlling the processor's temperature. In design terms, water-cooling kits come in two varieties — those designed for maximum heat dissipation and those built primarily with noise reduction in mind.

Typically, a water-cooling kit consists of a pump, radiator, reservoir, and a water block that attaches to the CPU. Flexible PVC or silicon piping is also included to connect the components. Most include fans to aid heat exchange at the radiator.

Worth a look

Putting many processors together in a small space creates substantial heat. HP has invented a novel way of handling overloads by adapting a print head cartridge that sprays coolant onto toasty chips (**www.hpl.hp.com/news/2002/apr-jun/cooling.html**).

Editor's Choice
October 2004
apc

Corsair HydroCool 200ex

Corsair's HydroCool 200ex is a stunning performer that works by cooling water using an aluminium radiator and a huge 150mm high-speed fan.

Installation is more complex than fitting a standard CPU cooler. Pipes and a thermal probe are fitted to its thin, copper-based CPU block in manufacturing, and mounting mechanisms for K7, K8 and Pentium 4 processors are provided. A small PCB designed for mounting in a PCI slot cover connects to the thermal probe and a small set of wires links to the power headers on your motherboard. Lastly, a 12V connector from the power supply provides electricity to the unit.

A serial DB9 cable connects the PCB to the cooling unit. Water tubes are fed through holes in the PCB's mounting brackets that also join the cooling unit. Once filled with water and the provided coolant, the system starts up in conjunction with the PC. Non-drip fittings on the back of the unit make disconnecting the pipes connected to the PC painless, though small amounts of fluid can leak out.

The external unit is very basic, with plain industrial styling. A red LED shows the current CPU temperature, and alarm and shut down limits can be set via the front panel. The whole unit is designed to be transportable, with a handle embedded into the top of the case.

The HydroCool 200ex kept the test system at a maximum temperature of 36°C under full CPU load, making it eminently suitable for keeping high-end and overclocked PCs from overheating. This excellent result is due to the large radiator and high-powered pump. Though it's not quiet when running in Turbo mode, the noise its standard operating speed generates is similar to that from fans in high-end PCs.

Given that the Prescott-core Pentium 4 processors have a Thermal Design Power of over 115W of dissipated heat compared to the Northwood-core's maximum output of around 90W, the requirements for keeping processors within operating parameters are becoming significantly more demanding. Though the Corsair HydroCool 200ex is no quieter than traditional cooling methods, its outstanding ability to control the temperature of the CPU make it hard to ignore.

Details

Contact	Altech Computers
Phone	(02) 9735 5655
Online	www.altech.com.au
Price	$470
✔	Outstanding cooling performance; portable.
✖	Noisier than other units; no easy way to check the water level.
Verdict	★★★★½

3R Poseidon

The Poseidon from 3R is the rogue of this bunch, with the poorest cooling results and a "silent" pump that rattles loudly during operation. It's a pre-built, self-contained unit similar to the Silent Stream (see page 66), but nowhere near as efficient.

Installation is as simple as the Silent Stream's, using a spring-tensioned screw to keep good downward pressure on the aluminium water block. The tiny reservoir and aluminium radiator can be mounted either externally or internally in the PC case, depending on the space available. This would be a handy self-contained cooling system if the 3R's results weren't so poor.

The 3R Poseidon kept the test system's CPU at 47°C when idle, which is several degrees higher than any other in this roundup. Under a full load, the kit maintained the CPU at a steady 50°C, a temperature more in line with the stock air coolers provided with processors. These elevated temperatures can be attributed primarily to the system's poor water flow.

Details

Contact	Com-Tek Computers
Phone	(03) 9329 2388
Online	www.com-tek.com.au
Price	$139
✔	Easy installation.
✖	Poor performance.
Verdict	★☆☆☆☆

Cooler Master AquaGate

The AquaGate provides plenty of options for power users. The brushed silver reservoir can be mounted internally or externally, and also includes a radiator and LCD control panel.

Installation of the unit is difficult, and it demands extra power from a mains source. The biggest problem is that the bundled PCI card includes a thermal probe for sandwiching between your CPU and the copper-based block. This is an effective way of measuring CPU temperatures, but it can lead to a damaged processor if care isn't taken during installation.

The AquaGate's LCD panel can be removed and inserted into the provided 5.25in bay cover, and the guts of the system can be mounted into a spare PSU port or other large space. Alternatively, the entire unit can fit into two 5.25in drive bays.

Keeping the test system at a respectable 34°C at CPU idle and a mediocre 43°C under full load, the AquaGate suffers from a slightly underpowered pump.

While a little tricky to install, the AquaGate is a self-contained kit that works well.

Details

Contact	Australia IT
Phone	(03) 9543 5855
Online	www.australiait.com.au
Price	$278
✔	Multiple mounting solutions.
✖	Tricky installation.
Verdict	★★★☆☆

Global WIN Jefi

If nothing else, the Jefi boasts a unique design feature — the reservoir can house plastic fish or other underwater decorations. A submerged mains-powered pump propels water through the aluminium copper-cored CPU block, and then drips the water down several plastic teeth. Further cooling is achieved with a semi-submerged circular heatsink.

Installation of the unit is a chore and the quick install instructions are next to useless. A clearer manual is bundled on CD, but the entire process is time-consuming.

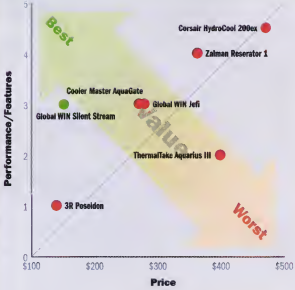
The Jefi's cooling unit doesn't include any temperature readouts, but does contain a rudimentary fan controller and a glass thermometer. However, power users will prefer some sort of advanced monitoring or readout.

It works reasonably well, keeping the test system at an idle temperature of 32°C and a maximum 42°C under load. The Jefi is suitable for users with moderate demands, though performance enthusiasts require a more efficient configuration.

Details

Contact	Com-Tek Computers
Phone	(03) 9329 2388
Online	www.com-tek.com.au
Price	$279
✔	Looks stylish; works well.
✖	Complex installation.
Verdict	★★★☆☆

apc price-to-performance ratio



Corsair's HydroCool 200ex offers superior performance over the competition, but is also the most expensive solution on offer. The Global WIN Silent Stream takes our best value award thanks to its reasonable performance and quiet operation. At just $149, it's a steal.

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M410APC

Global WIN Silent Stream

The Silent Stream is one of two sealed, self-contained units in this roundup. Consisting of a copper-cored aluminium CPU block with built-in pump, copper radiator and 80mm fan connected by soft silicon piping, the Silent Stream is as simple as water-cooling kits come. Installation is straightforward, being only slightly more difficult than a fan-based CPU cooler, and the radiator can be mounted internally or externally.

A power switch is included, as are components for mounting on Pentium 4 and Athlon CPUs. The kit comes pre-assembled and filled with coolant, with a top-up every three months recommended. This makes the Silent Stream ideal for those who don't want to mess around with complex water-cooling solutions.

For a system with such a small water capacity and reservoir, it performs quite well. The Global WIN produced impressive results for a closed system, with a temperature of 40°C at idle and 43°C under load. This can be attributed to the all-copper radiator and quiet 80mm fan.

Details

Contact	Com-Tek Computers
Phone	(03) 9329 2388
Online	www.com-tek.com.au
Price	$149
✔	Reasonably quiet; inexpensive.
✖	Not the best performer.
Verdict	★★★☆☆

ThermalTake Aquarius III

An external unit, similar to those from Corsair and Cooler Master, the Aquarius features two readout panels for the water tank and CPU temperatures measured by thermal probes. A fan speed controller and display are also built in. A side window shows the reservoir's water level and can be topped up when required. The system is extremely loud when running at high speed and barely noticeable at low speed; however, performance at this setting is poor.

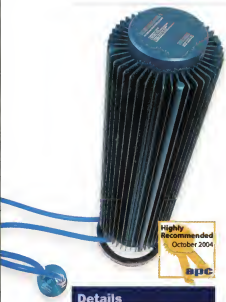
The unit's water block is of the thin copper type, with mounting tools for K7, K8 or Pentium 4 processors. The mounting system for the K7 is questionable, though, as the water block can move under the clips. This could cause damage in transit due to the weight of the water pipes.

The ThermalTake system performs more poorly while idle than two of its rival coolers under a full load, keeping the test system's CPU at 39°C. Results under load are equally disappointing at 48°C, and can largely be attributed to the unit's low water flow.

Details

Contact	Anyware Computer Accessories
Phone	(03) 9763 8200
Online	www.anyware.com.au
Price	$399
✔	Adjustable fan speed; excellent readouts.
✖	Poor cooling; pitiful water block retention mechanism.
Verdict	★★☆☆☆

Zalman Reserator 1



The Zalman is the only system in this roundup that doesn't use a fan. The Reserator 1 is completely passively cooled, and consequently the radiator needs to be much larger to compensate.

Measuring over 59cm high, the Reserator is an external finned cooling tower that sits next to a PC. It's not easily moved, but it looks great. Installation is as simple as fitting the water block and piping to the main unit, filling it with water, and then plugging it in.

An almost silent pump sits at the bottom of the tower, pushing water through the copper cored aluminium water block, which fits Athlon and Pentium 4 CPUs. A flow indicator shows when the water is moving through the system, which is important because the piping is opaque and the Reserator quickly overheats if the water isn't flowing. The design works extremely well and runs almost silently — it kept the test system at a low 31°C when idle, and 37°C under load.

Details

Contact	Altech Computers
Phone	(02) 9735 5655
Online	www.altech.com.au
Price	$362
✔	Quiet.
✖	Non-transportable; must be placed at same height as PC.
Verdict	★★★★☆

Water-cooling specifications

Manufacturer/ model	3R Poseidon	Global WIN Silent Stream	Cooler Master AquaGate	Global WIN Jefi	ThermalTake Aquarius III	Zalman Reserator 1	Corsair HydroCool 200ex
Contact	Com-Tek Computers	Com-Tek Computers	Australia IT	Com-Tek Computers	Anyware Computer Accessories	Altech Computers	Altech Computers
Online	www.com-tek .com.au	www.com-tek .com.au	www.australiait .com.au	www.com-tek .com.au	www.anyware .com.au	www.altech .com.au	www.altech .com.au
Phone	(03) 9329 2388	(03) 9329 2388	(03) 9543 5855	(03) 9329 2388	(03) 9763 8200	(02) 9735 5655	(02) 9735 5655
Price	$139	$149	$278	$279	$399	$362	$470
Idle temp (°C)	47	40	34	32	39	31	32
Max temp (°C)	50	43	43	42	48	37	36
Capacity (est)	100mL	100mL	600mL	1.5L	500mL	2.5L	500mL
Install time	20 minutes	15 minutes	60 minutes	60 minutes	45 minutes	30 minutes	60 minutes

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Ultra-portable projectors

***Stephen Dawson* examines 10 compact projectors, which ought to be a weight off the shoulders of the overburdened traveller.**

How we tested

A Gossen Lunalite meter was used for measuring output levels and contrast ratio. Claimed ANSI lumen figures are listed in the specification table. All tests were conducted producing the same image size on an LP Morgan Galleria projection screen with a gain of one and a neutral white finish. We used an XGA output signal at 75Hz for computer images, and interlaced PAL component video (S-Video in one case) for DVDs. Each projector was calibrated using the video tests from the THX Optimizer DVD, including the use of a blue filter to check for the correct colour balance.

If you spend a lot of time on the road delivering presentations, you probably already know how valuable a tool a small projector is. A mobile professional's projector has a distinctive set of characteristics that sets it apart from the booming home cinema units.

WHAT YOU NEED

Projectors are available in two flavours: Liquid Crystal Display (LCD) and Digital Light Processing (DLP). The former shines light through a LCD panel to produce images, while the latter relies on an array of mirrors on a small chip called a Digital Micromirror Device (DMD). LCD technology is older, DLP produces clearer, brighter images.

There's little room in notebook bags once the computer, literature, charger and other gadgets are stowed, so the smaller the projector, the better. This Labs Challenge specified devices weighing 2kg or less. Testing showed some of them to weigh just over 2kg while others are well under the limit.

A projector has to compete with any ambient light in the room — this isn't home theatre, so you can't rely on the presentation room being dark enough. The bigger the picture you want to project, the more powerful the projector's lamp will need to be.

As presentations will be shown in different environments with different light levels, you need to be able to easily adjust the size of the image to suit the room, as well as create realistic contrast and colour levels.

Just as you often won't be able to control where the picture will be displayed, you may not be able to choose and ideal surface for the projector to rest on. If your image ends up at an odd angle, keystone correction can get the picture looking square. Horizontal keystone correction is better still. However, keystone adjustment limits the effective resolution.

The device you choose should offer high resolution. These days, XGA (1,024 x 768 pixels) is the minimum you should expect.

The final feature to consider is inputs. VGA is standard, but DVI (Digital Visual Interface) or the M1 variant will also provide for the future. As some of these projectors will undoubtedly make the trip home on the weekends for watching movies, look for S-Video, composite and component inputs.

Hewlett-Packard mp3130

Editor's Choice
October 2004
apc

Details

Contact	Hewlett-Packard
Phone	13 23 47
Online	www.hp.com.au
Price	$3,899
✔	High output; good video performance; flexible.
✖	Sharpness control doesn't work on component video.
Verdict	★★★★½

Hewlett-Packard's mp3130 combines style with excellent performance — instead of the standard flat block, it stands upright on a narrow base. Weighing 1.8kg and standing around 20cm high, it can be a little precarious to balance. Thankfully, a release key on the front springs out a pair of extension metal legs, which provide a stable, 15cm wide base. The extension legs cant the projector up by a maximum of 8°.

The lens has an adequate zoom range of 1:1.2. Both manual and automatic vertical keystone correction is provided. The mp3130 is the only device in the group to offer horizontal keystone correction. This permits the projector to be laterally off-centre from the screen if the occasion demands, while retaining a rectangular image.

The XGA resolution DMD is a "double data rate" version, which operates faster than regular models to give more precise graduations of illumination. A 12° mirror swing offers a higher contrast ratio by enabling the DMD to tilt towards or away from the light. An impressive figure of 1,800:1 is achieved in contrast ratio tests.

The mp3130 throws out a lot of light, equalling the Epson EMP-735 as the brightest of the products in the roundup at a calculated 10,509.7 lux from a white screen. With the colour depth offered by the DLP system, it has no difficulty producing a large and powerful picture even with moderate amounts of ambient light.

DVD-Video output is excellent, with stable pictures and no flicker from the interlaced signal. All 576 horizontal lines are distinctly traced on a vertical resolution test disc. In addition to 4:3 and 16:9 ratios, the mp3130 offers a 1:1 mode, which displays the picture without scaling. However, this function displays images in the 4:3 ratio only.

The main VESA M1-DA input accepts digital and analog computer signals as well as analog component video in standard and high definition. The sharpness control doesn't function with component video, although S-Video and composite work well.

The remote control acts as a mouse when the projector is plugged into the computer via USB, and has a laser pointer.

BenQ PB2220

BenQ's 1.8kg PB2220 does a great job of handling RGB material from a computer. It delivers a consistently bright and sharp image, with a very good contrast ratio of 1,600:1, despite the full-black test signal being slightly marred by a low level of random noise.

The projected image is thrown slightly upwards from the lens axis, permitting it to be kept below the line of sight of audiences. Manual vertical keystone adjustment is featured, but should rarely be required.

While the DLP rainbow effect is rather marked on PAL video, it's well controlled at 75Hz XGA, only appearing on mostly monochrome images.

The noise levels from this projector are average, with noticeable whining from the single-DMD DLP colour wheel.

If you intend watching the occasional DVD, the PB2220 is not the projector for you. Video input handling is poor and makes the image appear out of focus. The projector's 1,024 x 768 pixels are well-focused, but its signal processing lets the machine down.

All connections are analog. However, BenQ is generous when it comes to cables, even bundling a component video-to-VGA lead. The remote control is a basic credit card-size type, lacking a laser pointer and providing no mouse control on the connected computer.

Details

Contact	BenQ
Phone	(02) 9714 6800
Online	www.benq.com.au
Price	$3,849
✔	Bright; contrast ratio; good image with computer signal.
✖	Poor imaging on video input; low-level noise on black signals.
Verdict	★★★½☆

Dell 3300MP

Tipping the scales at a comfortably portable 1.8kg, the Dell 3300MP is a solid little projector. It's fitted with a VESA M1-DA socket for all high-quality signals, and an LCD panel on the top indicates what's going on. The M1-DA accepts analog computer signals, digital signals (via DVI-to-M1 adaptor cable) plus component video, including high definition.

A hinged flap on the remote control covers a number of subsidiary keys. When closed, the remote operates the mouse on a USB-connected computer; when open, it reverts to the traditional remote control function.

Producing a huge image in a smallish room is problematic since the projector has a long throw. Automatic vertical keystone is available.

The Dell 3300MP performs well with analog XGA signals. There's plenty of range in the controls to boost colour for large screens, and sufficient brightness to operate efficiently in large rooms with moderate amounts of ambient light.

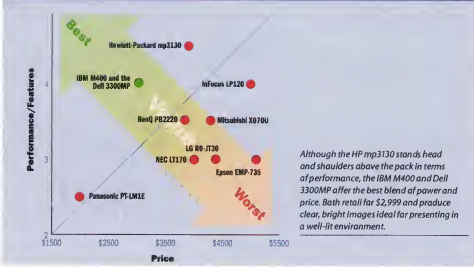
DVD-Video viewing is also well handled, with the projector delivering interlaced signals in the progressive scan format.

Switching between inputs is slow — the projector pauses for five seconds on each input lacking a signal before acknowledging another press on the Source key.

Details

Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	$2,999
✔	Good brightness; good general imaging.
✖	Flimsy remote control; slow input changes.
Verdict	★★★★☆

apc price-to-performance ratio



Although the HP mp3130 stands head and shoulders above the pack in terms of performance, the IBM M400 and Dell 3300MP offer the best blend of power and price. Both retail for $2,999 and produce clear, bright images ideal for presenting in a well-lit environment.

Get shorty

You can do it with mirrors too. NEC's WT600 ($11,500) eschews the lens to provide an extremely short-throw mirror-focused image — positioning the unit just 65cm from the screen produces a 2.54m display. More details can be found online at *www.nec.com.au*.

Epson EMP-735

The EMP-735 uses LCD panels to create its image, resulting in a low contrast ratio (measured at just 320:1), though this shouldn't matter too much for presentation work. More importantly, this projector ranks equal first for output brightness, with a calculated reading of 10,509.7 lux from a white screen.

The bottom of the image displayed by this projector is lower than the centre line of the lens (15cm for a 2.54m diagonal image). This means the projector must be situated on a high stand or tilted upwards to get a full image in the viewing area. As an alternative, the automatic keystone adjustment function can be used, but this reduces the effective resolution.

Epson's projector uses a credit card-size remote control which slips into a convenient holding bay on the projector's body for safekeeping. However, the remote offers no extras, such as a laser pointer or mouse control.

The 2kg EMP-735 features a PC Card slot and is supplied with an 802.11b PC Card, so you can drive the projector from your computer, eliminating the need for wiring.

DVD playback, however, isn't up to scratch. There is marked vertical jitter when fed with an interlaced 50Hz video signal, and progressive scan processing is lacking.

Oddly, the fan on the review projector runs even when the unit is in standby mode.

Details

Contact	Epson
Phone	1300 361 054
Online	www.epson.com.au
Price	$5,099 ($4,599 for wired EMP-730)
✔	High output; wireless operation; PC Card support.
✖	Image projected below centre; low contrast.
Verdict	★★★☆☆

IBM M400

At a light 1.2kg and measuring just 5.7 x 18.3 x 17.4cm, IBM's M400 is the second smallest unit on test. It's arranged just like a regular projector only smaller, and sports a corporate-friendly matte black finish.

Performance is strong in all areas except brightness tests, in which the M400 ranks last due to a low-power lamp. The high contrast ratio — measured at 1,800:1 — is the result of the XGA digital micromirror device. This is one of the newer DDR models with a wider, 12° swing of its micromirrors, similar to the Hewlett-Packard device. Manual vertical keystone adjustment is offered if required.

The other three projectors reviewed here which support digital video use the VESA M1 connection. IBM has stuck with the slightly more compact DVI-I, which supports both analog and digital inputs. A separate USB port is provided for computer connection, so the projector's laser pointer-equipped remote control can also act as a mouse if required.

Except for the M400's brightness limitations, which may hamper large displays in environments with lots of ambient light, picture quality is strong, with excellent colour rendition. Video handling isn't quite so proficient, though, with limited horizontal resolution. In a dark room, a slight halo is evident around the display area, suggesting inadequate control of internal reflections.

Details

Contact	IBM
Phone	13 24 26
Online	www.ibm.com/au
Price	$2,999
✔	Size and weight; good contrast.
✖	Limited brightness level.
Verdict	★★★★☆

InFocus LP120

The InFocus LP120 is the smallest and lightest unit in this roundup, measuring 5.3 x 24.9 x 9.8cm and weighing just 980g. If maximum portability is your primary requirement, look no further.

This XGA DLP projector also benefits from the new DDR DMD, making it the clear winner on contrast ratio at a measured 2,000:1. The LP120 features a small bulb to limit the amount of heat emitted which adversely affects brightness, with a calculated white screen lux measurement of 5,632. This measurement indicates that the LP120 is best used in environments where the amount of ambient light can be controlled.

A VESA M1 socket accepts both analog and digital computer signals. The supplied analog adaptor cable also features a USB plug. The "remote control" has just four keys, one of which operates the laser pointer, while the two arrow keys are limited to paging through PowerPoint presentations. The remaining Effect key can be assigned to one of a number of useful functions. All truly effective control of the projector is performed through the bank of backlit buttons on its top, supported by a two-line LCD panel.

Despite its diminutive size, picture sharpness is excellent, as is colour and picture stability for computer input. Interlaced video signals, however, show an irritating amount of jitter. As there's no support for component video, the LP120 is not really suitable for watching DVDs.

Details

Contact	InFocus
Phone	1800 885 481
Online	www.au.infocus.com
Price	$4,999
✔	Small size and weight.
✖	Ineffective remote control; no component video input.
Verdict	★★★★☆

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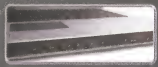

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LG RD-JT30

Details	
Contact	LG Electronics
Phone	1800 725 375
Online	www.lge.com.au
Price	$4,374
✔	Faroudja DCDi deinterlacing; good overall image.
✖	Low contrast ratio and brightness.
Verdict	★★★☆☆

There's a special surprise feature on the LG RD-JT30 — a Faroudja DCDi. Dealing with the tricky task of deinterlacing video, Faroudja DCDi is perhaps the mostly highly regarded video handling circuitry on the market, appearing in home cinema projectors costing as much as $40,000.

It does an excellent job of removing "jaggies" from DVDs, even in the difficult-to-handle NTSC format. But for all that, both the vertical and horizontal resolution are a bit disappointing, with finely spaced lines barely distinguishable.

It performs solidly via computer signals, with decent downscaling, although the picture is better at the native XGA resolution. At 990:1, the contrast ratio is relatively low for a DLP projector, and a reasonable amount of speckly video noise comes through on a totally black signal.

The brightness is nowhere near the highest of these projectors, but adequate for medium-sized venues with low levels of ambient light. However, the RD-JT30's boardroom presentation credentials are bolstered somewhat by the inclusion of VGA, S-Video and composite inputs.

One good design feature is the recessed lens, which enables the user to pack it into a notebook bag without being concerned about damage.

At 1.8kg, the LG unit is compact and offers good performance, but there are no new boundaries broken here. While this projector is not ideal for presentations, it is one of the better machines in this roundup for watching movies.

Mitsubishi XD70U

Details	
Contact	Mitsubishi Electric
Phone	(02) 9684 7777
Online	www.mitsubishi-electric.com.au
Price	$4,290
✔	Short throw lens; high output; good remote control.
✖	Heavy; jitter on interlaced video signals.
Verdict	★★★½☆

Mitsubishi's XD70U allows a big picture to be projected from very close range thanks to a lens which offers the shortest throw of any in this roundup. In our tests, it achieves a 2.54m diagonal picture at a distance of just 2.64m.

Even more impressively, the short throw isn't achieved at the expense of quality. The XD70U produces the third brightest output in this roundup at a calculated 9,805.6 lux on a white screen, and an excellent 1,900:1 contrast ratio. This combination means that it's almost as effective in a display area with high levels of ambient light as it is in a pitch-black dedicated viewing room.

Signal handling is limited to analog video, but Mitsubishi has included a USB port anyway so that the laser pointer-equipped remote control can operate as the connected computer's mouse.

The short throw doesn't seem to adversely affect screen coverage, and sharpness is retained across the whole display area. The power on tap, combined with a good DLP implementation, makes for top-notch picture quality with the computer, although jitter is evident from a 50Hz interlaced video signal from a DVD.

Projectors weighing less than 2kg were specifically requested for this Labs Challenge. However, contrary to Mitsubishi's claims of it weighing 4.4lbs (just under 2kg), the XD70U actually weighs in at 2.1kg, making it the heaviest unit in the roundup.

NEC LT170

Details	
Contact	NEC Australia
Phone	13 16 32
Online	www.nec.com.au
Price	$3,999
✔	Compact design; clean video performance.
✖	Image projected below centre; low contrast and brightness.
Verdict	★★★☆☆

NEC's 1.9kg entry certainly stands out from the crowd. It looks a bit like a log, being nearly 30cm long, with a lens at one end and connections on the side. A sliding lens protector, similar to those often found on compact digital cameras, is also present.

The LT170's engine employs a 12° DDR DMD in XGA resolution. But it's a little underpowered in the lamp department, coming in towards the lower end of the units tested in brightness, managing 6,469.5 lux on a white screen. Nor is the measured 630:1 contrast ratio exceptional.

Like the Epson EMP-75, the base of the projected image is below the level of the lens (15cm down for a 2.54m display), so audience view may be obstructed. Physically tilting the device is the only solution to this problem, but thankfully automatic vertical keystone adjustments will keep the picture square.

The LT170's zoom range is just half that of most projectors, making it suitable only for fine adjustment, something could be an issue in a cramped presentation room. The remote control works effectively but offers no extra facilities such as mouse control.

Some provision for interlaced video signals has been made by including a "Flicker Reduction" option, and this works effectively. The overall image quality is little better than average when presenting video material. However, images sent from a computer are delivered with excellent colour and sharpness.

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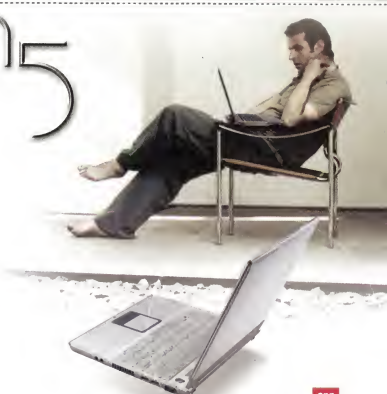

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Panasonic PT-LM1E

Details

Contact	Panasonic Australia
Phone	13 26 00
Online	www.panasonic.com.au
Price	$1,999
✔	Automatic vertical keystone correction.
✖	Low resolution; low contrast; image projected below centre.
Verdict	★★☆☆☆

Panasonic's PT-LM1E is the only unit on test to offer a native resolution of 800 x 600 pixels. This is well below the XGA standard and a huge strike against the compact 1.6kg unit.

The Panasonic projects the bottom of the picture below the level of the lens — 22cm down for a 2.54m screen — which means it must be placed fairly high or tilted upwards to get a viewable image. While both manual and automatic vertical keystone correction are offered, adjusting it reduces the effective screen resolution, something this projector can't afford.

Image quality is average: the projected image is uneven, with a white screen appearing slightly pink on the left and right sides, and blue in the middle. DVD playback is also poor, with images appearing blocky due to the low resolution.

Surprisingly, the horizontal resolution is adequate, accurately handling a 720 horizontal pixel test pattern. Unfortunately, the same can't be said for the vertical resolution. Significant detail is lost due to the mere 450 viewing lines available (the PAL format delivers 576), and there is noticeable jitter on interlaced PAL signals.

Computer signals fare better, but are still marred by the large size of the pixels. Although the PT-LM1E offers reasonable brightness, and is the cheapest projector here, a contrast ratio of just 400:1 and the low resolution of the display earns the PT-LM1E the wooden spoon.

Ultra-portable projector specifications

Manufacturer/ model	Panasonic PT-LM1E	Dell 3300MP	IBM M400	BenQ PB2220	Hewlett-Packard mp3130	NEC LT170	Mitsubishi XD70U	LG RD-JT30	InFocus LP120	Epson EMP-73S
Price	$1,999	$2,999	$2,999	$3,849	$3,899	$3,999	$4,290	$4,374	$4,999	$5,099
S-Video	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Composite	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Via S-Video	Yes
Component	Yes (via VGA)	Yes (via M1-DA)	Yes (via DVI-I)	Yes (via VGA)	Yes (via M1-DA)	Yes (via VGA)	Yes (via VGA)	Yes (via VGA)	No	Yes (via VGA)
VGA (D-SUB15)	Yes	Yes (via M1-DA)	Yes (via DVI-I)	Yes	Yes (via M1-DA)	Yes	Yes	Yes	Yes (via M1-DA)	Yes
DVI	No	Yes (via M1-DA)	Yes (via DVI-I)	No	Yes (via M1-DA)	No	No	No	Yes (via M1-DA)	No
Card support	No	Optional PC Card	No	No	Optional SAM module	No	No	No	No	PC Card
Technology (DLP/LCD)	3 x Active Matrix 13.97mm LCD	1 x DMD 0DR	1 x 0.7in 12° DMD 0DR	1 x 0.7in 12° DMD 0DR	1 x 0.7in 12° DMD 0DR	1 x 0.7in 12° DMD 0DR	1 x 0.7in DMD	1 x 0.7in DMD	1 x 0.7in 12° DMD 0DR	3 x polysilicon TFT Active Matrix LCD
Native resolution (pixels)	800 x 600	1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768
Rated output (ANSI lumens)	1,200	1,600	1,100	1,700	1,800	1,500	2,000	1,400	1,100	2,000
Rated contrast ratio	400:1	1,700:1	1,800:1	2,000:1	1,800:1	1,000:1	2,000:1	1,100:1	2,000:1	400:1
Measured contrast ratio	290:1	1,200:1	1,800:1	1,600:1	1,400:1	630:1	1,900:1	990:1	2,000:1	320:1
Black screen EV	1.7	0.4	-1	0	0.4	0.9	-0.1	0.15	-1	2.6
White screen lux (calculated)	5,254.84	8,536.51	4,902.94	8,536.51	10,509.68	6,469.46	9,805.88	6,036.22	5,632	10,509.68
Black screen lux (calculated)	17.86	7.25	2.75	5.50	7.25	10.26	5.13	6.10	2.75	33.34
Lamp type	130W UHM	160W P-VIP	120W	150W VIP	160W P-VIP	145W	200W HPM	150W NSH	120W UHP	150W UHE
Lamp life (hrs)	2,000	3,000	2,000	2,000	2,000	1,500	2,000	2,000	2,000	2,000
Replacement lamp cost	$399	$419	$569	$715	$818	$620	$849	$577	$499	$900
Vertical keystone	Yes/auto	Yes/auto	Yes	Yes	Yes/auto	Yes/auto	Yes	Yes	Yes	Yes/auto
Horizontal keystone	No	No	No	No	Yes	No	No	No	No	No
Carry case	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Warranty policy	2 years or 5,000 hours	2 years (lamp: 90 days)	3 years (lamp: 90 days)	2 years (lamp: lesser of 3 months or 500 hours)	3 years (lamp: lesser of 3 months or 500 hours)	2 years (excluding lamp)	2 years (may offer some courtesy coverage of lamp)	3 years (lamp: 3 months)	2 years (lamp: lesser of 3 months or 500 hours)	2 years (lamp: lesser of 3 months or 500 hours)
Dimensions (h x w x d, cm)	6.9 x 25.7 x 20.9	7.9 x 24.4 x 21.7	5.7 x 18.3 x 17.4	8 x 22.9 x 17.9	20 x 7.8 x 23	8.8 x 12.3 x 28.7	7.5 x 21.5 x 26.5	5.7 x 24.9 x 16.9	5.3 x 24.9 x 9.8	8.3 x 27.6 x 19.4
Specified weight (kg)	1.6	1.81	1.1	1.78	1.5	1.8	2	1.7	0.9	1.9
Measured weight (kg)	1.61	1.82	1.18	1.77	1.82	1.94	2.10	1.75	0.95	2.02

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Sub-$2,200 small business servers

With demands on IT infrastructure at an all-time high, *Matthew Overington* examines four servers pitched at small businesses.

How we tested

While all vendors in this roundup offer an OS with their servers, this Labs Challenge levels the playing field with a limit of $2,200 for hardware alone. We installed Microsoft Windows Small Business Server 2003 on each system and tested them with 10 client PCs.

But these machines aren't limited to running Windows. Linux-savvy network administrators are free to install a server-grade Linux distro like Red Hat or SuSE (see "Alternative operating systems", on page 77).

Points were awarded for server-class features like hot-swappable drives, tool-less entry, system locks, room for expansion and manageability.

Small servers are becoming increasingly popular for businesses looking to consolidate resources and get the most out of their IT budgets. Many small businesses or workgroups add servers to their networks to help share files and resources, or even to serve mail.

The machines in this roundup are suitable for small workgroups of up to 20 people, but overkill for a home environment. If you're looking to share a few files on a home network, try hunting down a bargain at a swap meet or on eBay.

Some enterprise server features like automatic failover and redundancy aren't required at this level, though monitoring features are welcome for busy system administrators. Although downtime isn't a massive concern on a small business system, it's still important to select a machine that's easy to maintain or add drives and RAM to as your requirements expand. After all, it's becoming extremely difficult to work if your networks and servers aren't up all the time.

Features such as tool-less entry and management software make life easier for administrators and help minimise downtime if something goes wrong.

Although $2,200 is a meagre budget for a server, you'll be pleasantly surprised at the range of solid features to be found at this level. Serial ATA hard drives are the norm, and while most vendors have opted for Pentium 4-based units, Hewlett-Packard has upped the ante by building up a Xeon-equipped screamer that even boasts a 36.4GB 10,000RPM SCSI hard disk. The HP unit is short on memory but is an excellent example of the sort of powerful machines available to small business at an entry-level price.

Editor's Choice
October 2004
apc

Details

Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	$1,909 (including delivery)
✔	Solid foundation; plenty of room for growth.
✖	Small hard disk.
Verdict	★★★★½

Dell PowerEdge 700

Dell's winning entry features a desktop processor that's been tweaked to fit a server platform.

The PowerEdge 700 is built on a 2.8GHz Pentium 4 processor running on an 800MHz frontside bus. This provides a solid base which is backed up by 512MB of 400MHz dual channel ECC memory in two 256MB modules. The ECC RAM, while a little slower than conventional memory, provides error checking and offers extra stability over regular DDR.

A server's storage requirements can be extreme, so it's disappointing to see Dell spec a single 40GB Serial ATA hard drive. Thankfully, it has included an Adaptec dual channel Ultra160 SCSI controller and three empty drive bays so more high-speed disks can be added.

The case is lockable and features thumbscrew entry, and all the drives sit in a removable caddy. The motherboard includes three PCI-X and two PCI slots, along with a spare Serial ATA connector, so there's room for expansion. It also has a floppy drive, a vital consideration as most RAID drivers and BIOS updates still require the use of floppies.

In terms of connectivity, Dell includes an Intel Pro/100 S Server Ethernet adaptor and an integrated Gigabit Ethernet controller. This provides a fast connection to the office backbone along with the option to segregate networks directly from the server.

All the machines in this roundup ship with CD-ROM drives — a considerable oversight given that many MSDN software packs ship on DVDs. DVD-ROM drives are only a little more expensive than CD-ROM drives, and there's little reason to include outdated drives.

Dell rounds out its outstanding feature set with 24-hour telephone tech support and a one-year, next-business-day parts and onsite labour warranty, an important consideration if the server is going to form a key part of your network infrastructure. This warranty doesn't extend to weekends, though Dell also offers a parts exchange service for a total of three years.

Although the review machine ships without an OS, Dell includes its OpenManage and Server Management Software Suite, which enables system administrators to manage and configure the server quickly and easily. This is important if an administrator is running the server in addition to performing other duties in the office.

At $1,909, the PowerEdge 700 is a solid offering. It easily manages a client load of 10 connected PCs and is up to the task of running as a small business Exchange or Notes server. Though serious buyers will need to up-spec the drives before considering using the machine as a file server, there's plenty of room inside the case for growth.

Acer Altos G310 Series

Acer's entry looks more like a desktop PC than a server and offers very little in the way of dedicated server technology. The system is built on a 2.8GHz Pentium 4 processor and features 1GB of Apacer memory consisting of two 512MB modules in a dual-channel configuration. Unfortunately, Acer has opted for quantity over security, as the memory doesn't offer error checking.

There are two 120GB Western Digital Serial ATA drives fitted and the motherboard offers Gigabit LAN and Serial ATA RAID 0 or 1, with five spare PCI slots. Unfortunately, the system doesn't offer a PCI-X slot, which might be an issue for those who want to add a high-speed SCSI controller as there are no spare Serial ATA channels. CD-ROM and floppy drives round out the features.

The case features a lock and thumbscrews, and a quick release drive bay holds up to four hard disks. Despite the five free PCI slots on the motherboard, the system relies heavily on onboard functions, which tie up CPU resources during operation.

Acer's EasyBUILD and Server Manager software are available as optional extras to help configure and manage the machine, and a fantastic three-year onsite warranty with round-the-clock phone support provides a level of insurance for busy administrators.

In conclusion, the Altos G310 system isn't as expandable as some of the other servers in this roundup, but the warranty is enough to save the machine from a poor score.

Details

Contact	Acer
Phone	1300 366 567
Online	www.acer.com.au
Price	$1,999
✔	Generous storage; excellent warranty.
✖	Poor future-proofing.
Verdict	★★★☆☆

ASUS AP130-E1

On paper, the ASUS AP130-E1 looks much like the Dell PowerEdge 700. The system is based on a 2.8GHz Pentium 4 processor running on an 800MHz frontside bus. It includes 512MB of ECC RAM in a single-channel configuration, though the motherboard supports dual-channel memory.

This machine relies on an onboard Gigabit Ethernet adaptor as its only network connection, which ties up some CPU resources. Thankfully, ASUS compensates with the dual 80GB Seagate Serial ATA hard disks. An onboard RAID controller provides RAID 0 or 1, offering performance or redundancy at the expense of CPU time. Both CD-ROM and floppy drives are fitted.

The case features a lockable front panel and thumbscrews for the side panel. Clips hold the drives in place, and there are two free hard drive slots for future expansion. Two PCI and two PCI-X slots are also available.

ASUS's System Web-based Management (ASWM) 2.0 is included, a system which allows the administrator to control the server from another desk in the office, or even over a remote connection. A Trend Micro Server Protect antivirus licence is also included, along with a one-year onsite warranty. This covers any problems experienced during business hours, and Cassa offers a next-business-day replacement on parts.

Although the ASUS AP130-E1 offers superior storage capacity over Dell's PowerEdge 700, the significantly better warranty and dedicated SCSI adaptor ensure that the Dell wins out.

Details

Contact	Cassa
Phone	1300 365 047
Online	www.asus.com.au
Price	$1,999
✔	Two 80GB hard disks.
✖	Reliance on onboard functions.
Verdict	★★★☆☆

Alternative operating systems

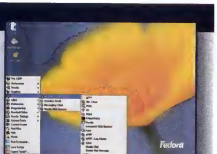
One important factor when shopping for a server is the type of operating system you want to run on it. The machines in this roundup can all be supplied ex-OS, but it's generally cheaper and easier to go for a hardware and software bundle. The cost will vary based on your needs, so discuss them with several hardware providers.

Generally, most small businesses will want to run with Microsoft Windows Small Business Server 2003, but there are plenty of other choices out there for small business environments, including Novell Netware and server-grade Linux distributions.

Novell (1800 244 364) offers an evaluation version of NetWare 6.5 at **www.novell.com/products/netware/eval.html**, and the retail version is $1,685 for five users.

Options for those who prefer Linux are almost endless, but larger vendors like Red Hat and SuSE can provide critical support for small businesses. SuSE Linux retails for US$349 per year for a 2-CPU server. A 30-day trial of Enterprise Server 9 is available at **www.novell.com/products/linuxenterpriseserver/eval.html**.

Red Hat's small business option, Red Hat Enterprise Linux ES, from $649, is distributed by Ingram Micro (1300 653 333) and is also available from **www.apac.redhat.com**.



Red Handed: *Linux is also a viable OS for servers.*

Highly Recommended October 2004 apc

Hewlett-Packard ProLiant ML150

Details

Contact	Hewlett-Packard
Phone	1300 305 018
Online	www.hp.com.au
Price	$2194.50
✔	Powerful hardware; room to grow.
✖	Small hard disk; meagre RAM.
Verdict	★★★★☆

Hewlett-Packard's ProLiant ML150 is a unique system that's every bit a server. The motherboard features two CPU slots and sports a 2.8GHz Xeon processor, leaving one free for future expansion. Six RAM slots are present, as are onboard IDE and SCSI adaptors. There are no Serial ATA slots, though the system has four spare PCI-X slots and a single PCI slot, so it's easy to add another hard disk controller. This is a great option for administrators on a budget, as Serial ATA hard disks are much cheaper than their SCSI counterparts.

The case offers thumbscrew entry, and a caddy holds the drives in place. Floppy and CD-ROM drives are included for applying updates.

HP has skimped in a few areas in order to provide a system which is the easiest to upgrade of all those in this lineup. The ProLiant ML150 features a single 256MB ECC RAM module and one 36GB 10,000rpm SCSI Ultra 320 hard disk. While the other machines in this roundup have 300 to 350W power supplies, this server ships with a massive 450W unit, offering plenty of juice for additional hard disks.

A one-year onsite warranty covering parts and labour is included, along with a two-year parts warranty. A well-rounded software suite helps to manage and configure the server.

In its raw configuration the HP is very fast and offers plenty of room to grow. If you currently have moderate server requirements, but can see your business — and its demands — growing in future, this is the machine for you.

Server specifications

Manufacturer/model	Dell PowerEdge 700	Acer Altos G310	ASUS AP130-E1	HP ProLiant ML150
Price without OS	$1,909 (including delivery)	$1,999	$1,999	$2,194.50
Price with Windows Small Business Server 2003 (5 CALs)	$2,259	$2,69B	$2,89B	$3,293.50
Processor	2.8GHz Pentium 4	2.8GHz Pentium 4	2.8GHz Pentium 4	2.8GHz Xeon
RAM	512MB	1,024MB	512MB	256MB
RAM speed	400MHz dual channel ECC	400MHz dual channel	400MHz single-channel ECC	333MHz single-channel ECC
Hard disk	40GB 7,200rpm Serial ATA	Two 120GB 7,200rpm Serial ATA	Two 80GB 7,200rpm Serial ATA	36GB 10,000rpm SCSI Ultra 320
Primary network interface	Integrated Gigabit Ethernet	Integrated Gigabit Ethernet	Integrated Gigabit Ethernet	Integrated Gigabit Ethernet
Secondary network interface	Intel Pro/100 S Server adaptor	N/A	N/A	N/A
Extras	Adaptec dual channel Ultra160 SCSI controller	N/A	N/A	N/A
Spare PCI-X slots	3	0	2	1
Spare PCI slots	2	5	2	4
Optical drive	CD-ROM	CD-ROM	CD-ROM	CD-ROM
Floppy drive	✔	✔	✔	✔
Lockable case	✔	✔	✔	✔
Tool-less entry	✔	✔	✔	✔
Bundled software	OpenManage and Server Management	Acer EasyBUILD and Acer Server Manager	ASUS System Web-based Management (ASWM) 2.0	ProLiant Essentials
Warranty	One-year onsite next business day parts and labour warranty, additional two-year RTB warranty	Three-year onsite next business day parts and labour warranty	One-year onsite next business day parts warranty	One-year onsite parts and labour warranty, additional two-year RTB parts warranty

Style & Performance

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PC overhaul

With bottlenecks banished, Serial ATA upgrades are finally worthwhile when building a new PC, explains *Asher Moses*.

Instant expert

- **Best used with PCI Express boards.**
- **Longer cables are ideal for larger cases and external drives.**
- **Lack of jumpers makes configuration easier.**
- **Speed demons should wait for SATA II.**

Serial ATA II

The increased bandwidth of Serial ATA II is definitely worth waiting for if performance is of particular importance.

Boosting speeds from 150MB/s to 300MB/s in total, SATA II will also include a port-multiplier feature allowing up to 15 drives to be connected to a single controller, support for external drives, and native command queuing for more efficient execution of instructions.

A fast hard drive is mandatory for applications that frequently access large files such as video editing and gaming. However, unlike two years ago when 7,200rpm ATA133 drives were standard, the decision is slightly more difficult today. At a maximum theoretical bandwidth of 133MB/s, Parallel ATA (PATA) technology has just about reached its peak, and hard drives are fast becoming a bottleneck on PC performance.

Enter Serial ATA (SATA). Introduced in 2001, SATA has now firmly established itself in the market as the next drive interface, but is it worth the upgrade?

SATA utilises a serial link for transmitting and receiving data, while PATA drives send data in simultaneous, parallel routes. This creates a number of issues, the most serious being the increased risk of run-time errors over long distances since data isn't sent in a constant stream. Thus, the maximum cable length for ribbon cables on PATA drives is 45cm, while SATA cables can be up to 1m.

Initially, SATA controllers were attached to the ageing PCI bus, which plagued system performance as its peak theoretical bandwidth was a meagre 133MB/s. Therefore, regardless of how fast the drives could send or receive data, the strong reliance on the PCI bus meant that a performance cap was inevitable.

Performance plus: *Serial ATA promises high speed data transfers with minimal interference.*

Today PCI Express is beginning to take control, offering a minimum bandwidth of 2.1GB/s, making it ideal for use with SATA drives. The fact that support for the standard has now been integrated into most recent Southbridge designs means that the PCI bus is now a non-issue.

In its current form, SATA offers few performance incentives over PATA, but there are many other benefits that make it an obvious choice for those building a new system from scratch. While it's also an ideal upgrade for PATA users, if you're purely after performance, it may be worth waiting for Serial ATA II (see "Serial ATA II").

Serial data can be transferred over longer distances (ideal for use with external drives and large cases), but can also run at much higher speeds without posing any risk to data synchronisation or being affected by external noise. The first SATA iteration boasts a maximum theoretical bandwidth of 150MB/s, which isn't a huge advantage over the 133MB/s offered by PATA drives (although most are only capable of reaching 100MB/s). However, SATA bandwidth figures are set to reach 600MB/s by 2007.

Perhaps the trump card of serial technology is the fact that it requires very little configuration. With PATA drives, users had to go through the trouble of setting the master/slave jumper when two or more drives shared the same cable, resulting in the already minimal bandwidth being shared by both devices. Conversely, SATA is point-to-point, meaning that each device is connected to the host via a direct link. This effectively minimises the overhead caused by co-ordinating accesses between the master and slave device sharing the same cable.

Other noteworthy features of SATA include hot-swapping (the ability to insert and remove drives whilst the system is in use), lower voltage requirements (0.5V as opposed to 5V on PATA) and the airflow/cable routing advantages resulting from the marked difference in cable width.

Serial ATA on DVD?

Serial ATA wasn't designed purely for internal hard drives, and there are a number of other mass storage SATA components on the way (though the only devices announced so far are DVD drives). These include:

DVD-ROM/RW

CD-ROM/RW

Tape devices

Zip drives

Silence of the fans

Need a Panadol to play with your PC? *Asher Moses* explains how an improved cooling system and quieter components can save you a headache.

Try and sleep with seven fans roaring away at 7,000rpm, and you'll understand why silent PCs are a godsend. They're also useful for recording music and watching DVDs. Lounge room systems used for DVD playback are a prime example — the constant whirring of a fan can ruin the suspense of a good thriller. Fortunately, there are a number of ways to make your box quieter.

CPU

If possible, try to obtain a unit that comes with a fan speed controller. This will allow you to manually adjust the speed to a suitable setting that's both quiet and effective in your particular environment. Anything up to 2,500rpm is fairly muted, but it's possible to get fan speed down to about 1,300rpm while maintaining adequate cooling performance.

Secondly, try a copper heatsink, as copper is a more efficient conductor of heat than aluminium. A product that embodies all of these features is the Zalman CNPS7000A-Cu, which can be purchased for $55 from PC accessory reseller PCCaseGear (**www.pccasegear.com**). Zalman also manufactures a fanless heatsink for total silence, the CNPS6500B-Cu.

While you're at it, take a look at the smaller fan on your CPU's Northbridge. These can be replaced by fanless heatsinks such as the Zalman Northbridge Cooler for under $15.

GRAPHICS

Graphics cards are another major source of PC noise, as owners of the GeForceFX 5800 Ultra can attest. Try a heatsink with a heatpipe, such as Zalman's ZM80A-HP, which does away with fans altogether. ATI Radeon cards are far quieter — owners of these cards may see little reason to upgrade.

POWER SUPPLY

The power supply is the second loudest source of noise behind the CPU cooler. Generally, units with a single fan run louder than those with multiple fans, as it's required to spin much faster to give the same effect. Manufacturers such as Thermaltake, Antec, Maxpower, Enermax and Zalman all offer effective silent PSU solutions, opting for larger heatsinks and slower fans to minimise noise. These can be purchased from online retailers such as PCCaseGear and AusPC Market (**www.auspcmarket.com.au**).

Music to your ears: *Antec's Sonata is a good example of an enclosure designed specifically for quiet computing.*

QUIET CASES

With fan usage reduced, the choice of case is crucial — there must be sufficient airflow and case fans in order to avoid overheating. Antec's Sonata, which sells for under $200, is a good example of an enclosure designed specifically for quiet computing. It features hard drive brackets with rubber grommets to absorb vibration, two 120mm low rpm fans at the front and rear for intake and exhaust, and a bundled Antec TruePower silent PSU.

If you don't want to upgrade your entire case, swap small, high speed case fans for larger, slower ones that cut down on noise. Pansonic's PanaFlo Ultra Quiet 80mm fans are almost inaudible at 21dB and sell for less than $20. As with the CPU fan, purchase a couple of fan speed controllers for each case fan. Controllers such as Zalman's Fan Mate are cheap (around $11) and effective, while a more elegant method is the rheobus/fan bus, which slides into a spare 5.25in drive bay and can control up to four fans. You'll need to spend around $30 for a quality unit.

DRIVES

Hard drive speeds are also important in reducing noise. With the average hard drive spinning at upwards of 7,200rpm, it's important to choose a manufacturer that has quiet computing firmly in mind. One such manufacturer is Seagate, which adopts Fluid Dynamic Bearings as opposed to the traditional ball bearings used in the majority of hard drives. As a result, Seagate drives are virtually silent, emitting no more than 24dB when running in silent mode.

As a final note, all of the aforementioned techniques must be used in combination for best effect — none will be entirely effective in isolation. STIT

A mighty wind: *large, slow fans are quieter than small, fast fans.*

Instant expert

- **Fanless heatsinks for the CPU, graphics card and motherboard components are silent yet reduce heat.**
- **Large, slow fans are quieter than small, fast fans.**
- **Enclosures with maximum airflow and minimum case fans are crucial when reducing noise.**

Draining water now

Enthusiasts with deep pockets and a willingness to get their hands wet may want to invest in water-cooling units, which while being more expensive and tricky to set up, are as quiet as a fanless heatsink and far more effective. Water-coolers come complete with mini pumps and tiny PC versions of car radiator grilles. Prices range upward from $300. Check out our Labs Challenge on page 62 for reviews of a range of DIY kits.

Next month

Sound cards: unjumbling THX, EAX and other sound card features.

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If you don't upgrade your DVD drive, you're not using it to its full potential, says ***Dan Warne***.

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96 Your free DVD+R
On *APC*'s cover you'll find a free DVD+R, thanks to our joint promotion with NaSa Multimedia Technology.

Extreme DVD burn

A full DVD burn in close to six minutes? *APC* shows you how to get there using the fastest drives, upgrade hacks, a step by step guide to ripping, extracting, and more.

Take a close look at your DVD drive: is it hiding some important secrets? For the growing number of hard-core enthusiasts now upgrading their drives with downloaded firmware upgrades, the answer is yes. And for those trying DVD hacks, the pay-off is potentially even bigger.

While hacking isn't for everyone — at worst, you risk ruining your drive permanently — those willing to take the chance are discovering that this black art can yield fantastic results, not least the ability to upgrade from 4.7GB discs to 8.5GB without buying a new drive, not to mention faster speeds and better disc compatibility. Who knew your trusty DVD burner could perform such feats?

For an idea of just how popular DVD hacking is, visit **www.cdfreaks.com**, which bills itself as the world's largest CD and DVD "community". There you'll find links to official firmware upgrades, information about Double Layer hacks, news on triple format burner technology and, most importantly, forums where DVD drive owners debate the merits of flashing a Lite-On drive with Sony firmware.

In short, DVD burning is growing into an enthusiast's game that's not just for speed and capacity freaks. If you're anything like us, you probably find yourself asking questions like "How do I extract VOB files?", "Which file format should I use?" and "Can I upgrade my burner?" It's a classic example of a computing technology that seems relatively simple, but in reality requires navigation through a constantly expanding labyrinth of file formats, technologies and compatibility issues.

This guide to extreme DVD provides you with the information to deal with these issues, as well as the inside story on how to burn faster and better.

DOUBLE YOUR CAPACITY

The big news is that some of today's standard single layer drives are eminently hackable, making it possible to upgrade their burning capability from 4.7GB to 8.5GB. Our guide to upgrading drives starts on page 84.

If speed's not your top priority, Double Layer drives allow up to 8.5GB of data to be written to a single disc. The technology employs two separate dye layers sandwiched between slivers of plastic in the disc media. Once a Double Layer burner reaches the capacity of the first dye layer, it simply refocuses the laser, passing through the first layer and recording to the second layer.

But it's not just the underground hacking community pushing the upgrade message. Major drive manufacturers are backing the concept as a route to better disc compatibility and speeds.

In particular, a lack of media is pushing drive manufacturers to be creative in their approach. Pioneer is verifying which 8x media can be successfully burned at 16x. The company's new 16x DVR-A08XLR drive (see review on page 52) includes media ID codes that match with 8x discs and can be burned at a whopping 16x.

"The end user is going to have to do a few firmware upgrades along the way, but we think it's the best way of managing it now, given that 16x media won't be available until the end of this year at the earliest," says Pioneer's national sales manager for business systems, Simon Bartlett.

Manufacturers are pushing for better compatibility and speeds

THE SIX MINUTE BURN

For those after bleeding edge speeds, the good news is the final 16x DVD+RW specification for drive and media makers. Although such discs hadn't gone on sale at the time of writing, Verbatim says the new format allows data to be written at an amazing 21MB/s.

Philips, one of the first manufacturers to announce its 16x drive, says a 4.7GB disc will burn in less than six minutes — almost the maximum speed optical drives are capable of sustaining.

As the Philips technology boffins explain: "[Burning] becomes increasingly difficult at higher recording speeds, because the available time to heat and cool the dye at the position of a mark becomes shorter."

According to the company, the challenge is to avoid heating adjacent data blocks and inadvertently erasing them due to the high laser power required to write in extremely short pulses.

Other speed increases are also around the corner for first generation Double Layer burners, which can take up to 45 minutes to complete 8.5GB burns. Pioneer is taking a leaf from DVD drive hackers' handbooks, burning to the just-released 2x DVD+R DL media at 4x. The company's new $329 DVR-A08XLR drive allows 8.5GB DVD+R DL burns to be completed in a mere 27 minutes. It's a sign of what lies ahead for Double Layer speeds in the future.

William Maher and Dan Warne

Extreme burning

DOUBLE LAYER: TWICE THE CAPACITY

Double Layer drives allow 8.5GB capacity burns — large enough for two to three hours of video without compression. But at 4x maximum speed, they're slower than single layer and discs cost about $15 each.

16x DRIVES

The fastest optical drives on the market, with full 4.7GB burns achievable in around six minutes. Manufacturers say it's about as fast as DVD writing is going to get because of the limitations of DVD media.

MULTIFORMAT DRIVES

Don't buy a drive that will only write to -R or +R media. Quality burners that can write to all formats (except DVD-RAM) sell for less than $200.

UPGRADE HACKS

Common mods include uncapped DVD ripping speed, overclocked burning, writing to 4x media at 8x speed and transforming single layer drives to Double Layer.

TRIPLE FORMAT BURNERS

Burners of the future will be able to write CDs, DVDs and Blu-ray discs using just one optical pickup. These drives start hitting the shelves from 2006.

The future: Blu-ray, HD-DVD and the 50GB disc

The future of DVD, particularly for recording space-hungry high-definition television (HDTV), is in high capacity blue-laser DVD technologies. And it's starting to look like a VHS versus Betamax-style showdown between Blu-ray and HD-DVD.

To date, only two Blu-ray recorders have been released for HDTV recording, and only in Japan. Both sell for around $4,000. However, major PC makers Dell and HP have thrown their weight behind the format.

The Sony-backed Blu-ray format embraces MPEG-2 for video encoding but uses a 38% narrower blue laser to write ultra-high density data to the disc, boosting storage to 27GB on a single-sided disc and up to 54GB on a double-sided disc.

Toshiba and NEC's alternative format, HD-DVD, uses vastly more efficient video encoding — either MPEG4-AVC (Apple QuickTime) or VC9 (Windows Media). Capacity is only 15GB on factory-made discs or 20GB/32GB on single/Double Layer recordable discs, but a 15GB HD-DVD disc stores around 180 minutes of high-definition video while Blu-ray discs only store 132 minutes. Microsoft is backing the HD-DVD format for Longhorn. HD-DVD recorders won't go on sale until 2005, but no word on sales in Australia.

Winner takes all: *Blu-ray and HD-DVD are about to engage in a war that will recall the days of VHS versus Betamax. And as we all know, the best technology doesn't always win.*

Supercharge your burner

If you're not upgrading your DVD drive, you're missing its full potential. But what are the risks? *Dan Warne* investigates.

On the cover CD

Upgrade your drive

It's easy to upgrade your burner with the firmware files on this month's cover CD. Use the drive analysing tools (such as Nero InfoTool) to determine your drive's exact model number, then match that to the updater on the CD. Copy the firmware updater from the CD to your desktop, remove the disc and run the updater.
The CD contains official firmware for the following brands: AOpen • ASUS • BenQ • BTC • Diamond Data • Gigabyte • Iomega • LG • Lite-On • Mitsumi • OptoRite • Panasonic • Pioneer • Plextor • Ricoh • Sony • TDK • Teac • Toshiba. WARNING: Although these firmware updates come from the manufacturers, modifying firmware is an intrinsically risky process. If it fails, your drive may become unusable.

Inside info

- The Firmware Page
  www.rpc1.org
- CD Freaks.com
  www.cdfreaks.com
- CD Media World
  www.cdmediaworld.com
- DVDINFOPro
  www.dvdinfopro.com
- CDRLabs.com
  www.cdrlabs.com

Firmware upgrades for DVD drives not only fix any disc compatibility issues, but in some cases they can also let you burn discs faster.

Manufacturers face an uphill battle of keeping their drives working properly with new brands of media and dye-layer types. The industry attempts to deal with this problem by embedding a "media ID" code in mass-produced blank discs. Burners then read this code and if it's recognised, adopt a factory-determined "writing strategy" for laser strength and write speed. If it isn't recognised, the burner takes a "best-effort" approach, which may result in burn errors. To find out your media's ID code, use Nero's freely-downloadable CD-DVD Speed tool. Under the Extras menu, select Disc Info. The information in the code field is the media ID.

With updated firmware, a drive has a better chance of making more successful burns, more often. To find the files you need, check the upgrade toolkit on this month's cover CD (see page 8 for the full contents). Also try the manufacturer's Web site, or take a punt on a region-disabled version at **http://RPC1.org** or **http://cdfreaks.com**. Keep in mind that if it's not the manufacturer's installer from the official Web site, you run the risk of ruining your drive. However, it's usually just a quick download and one-step update process.

THE RISKS OF DVD HACKING

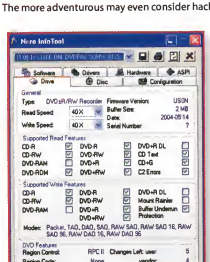
The more adventurous may even consider hacking a drive. However, flashing hardware can turn your drive into an expensive paperweight. Remember that making these modifications will void your drive's warranty.

1 A Lite-On 812S drive was reflashed in the *APC* Labs to test the risks of a firmware hack. This was an 8x single layer burner which enthusiasts have reported successfully reflashing with the Double Layer 832S firmware.

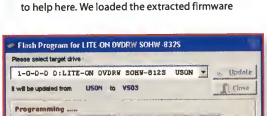
Lite-On's official firmware updater won't "cross-flash" the drive with the superior model's firmware, but the "Code Guys" at DVD hacking forum RPC1 (**http://codeguys.rpc1.org**) provide freeware tools that work around these limitations.

2 The X-Flash-X tool allows the extraction of the Double Layer 832S firmware from Lite-On's official installer, so there was no need to download pirated firmware. The official 832S firmware version VS08 was downloaded from **www.apcmag.com/info/liteondvdfirmware** and the binary file extracted using X-Flash-X.

At this point we "fixed" the firmware so it could be cross-flashed into a different drive. The CodeGuys OmniPatcher tool (**http://codeguys.rpc1.org/patchers.html**) is designed to help here. We loaded the extracted firmware



1 *Nero's InfoTool provides all the information you need about your drive's specifications.*



2 *The appropriate firmware is downloaded and installed ready for flashing.*

Caution

WARNING: using non-manufacturer-approved utilities will void your drive's warranty. Be aware that modifying firmware is an intrinsically risky process. If the process fails, your drive may become unusable. You should not use these tools unless you are prepared to void your warranty and cause potentially irreversible damage your drive. The publisher, ACP Publishing Pty Ltd and its associates and affiliates, and its officers, agents and employees (collectively, "ACP"), accept no responsibility for any loss or damage, whether direct or indirect, arising out of or in any way connected with the use of these tools. The reader uses these tools at their own risk and indemnifies ACP for any such loss or damage.

file (VS08.bin), applied the "fix dead drive blink/enable cross-flash" patch using OmniPatcher, and then saved it to VS08-fixed.bin.

Next, we used the LtnFW utility (**http://dhc014.rpc1.org/howto.htm#LtnFW**). LtnFW is a tool produced by enthusiasts that allows the uploading of any firmware to a drive. Remember, firmware should never be updated in this fashion unless you are prepared to void the warranty and possibly destroy your drive.

3 Then the firmware was updated. We used the Nero InfoTool (on this month's cover CD) to check the capabilities of the drive.

UP AND RUNNING

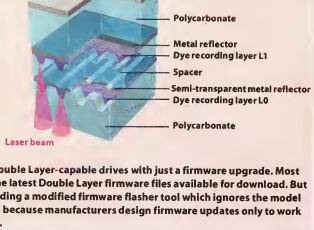
To test the modification, an attempt was made to burn 7.5GB of files to a Verbatim Double Layer DVD+R using Nero 6.

4 Nero took a long time to get started. When the program finally launched, it reported it was burning on layer one. After 15 minutes, it was stuck on 22% and all hard drive activity ceased. At 50 minutes, Nero was force-quit and the disc was thrown out.

That's not to say that people aren't having success. On the CodeGuys hacked firmware site (**http://codeguys.rpc1.org/firmwares.html**), there's a huge list of premodified firmware that other users have successfully tested. Not wanting to breach copyright, we didn't download the firmware, but user reports on online forums suggest that the firmware updates work perfectly, allowing Double Layer burns on the 812S drive. But this can be risky, so again, don't cross-flash your drive unless you're prepared for the possibility that it may stop working.

Double Layer hacks: behind DVD's worst-kept secrets

The difference between single and Double Layer drives isn't much. Double Layer burning simply requires the laser to be refocused mid-burn to reach the second recordable dye layer on the disc. This relies on a refocusable laser in the drive. Many recently manufactured single layer drives are actually identical to their Double Layer brethren, making it possible to turn them into Double Layer-capable drives with just a firmware upgrade. Most manufacturers even make the latest Double Layer firmware files available for download. But where things get tricky is finding a modified firmware flasher tool which ignores the model of drive it's writing to. This is because manufacturers design firmware updates only to work with the correct drive model.



Many other brands and models of drive are reportedly being upgraded in the same fashion to Double Layer. The NEC 2500A can apparently be reflashed to become a 2510A Double Layer.

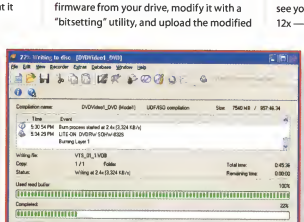
EXCEEDING THE SPEED LIMIT

If you've bought an 8x DVD burner but can only find 4x media, one useful hack that worked perfectly in the *APC* Labs enables a drive to "overspeed" its burns. It allows 4x media to be written to at 6x or 8x. The important variable is the media's quality.

RPC1.org has a wealth of firmware modification utilities for most models of burners. All you need to do is extract the firmware from your drive, modify it with a "bitsetting" utility, and upload the modified firmware back onto your drive. A Pioneer D107 8x burner was successfully reflashed to write at 8x on 4x media, burning at 8x on Ritek G04 4x DVD-R media, and at 6x on Princo A-Grade DVD-R media. Discs burned at these speeds verified perfectly. Once again, this may not always work properly, leaving you with an unusable drive.

Firmware hacks can also remove irritating restrictions like the artificial speed limit on DVD-Video ripping, which Hollywood successfully lobbied the drive makers into adopting as an anti-piracy measure. That's well and good, but if you want to rip home movies from DVD to your hard drive, 3x is frustrating. A simple firmware update will see your drive ripping at a theoretical max of 12x — about 7.5x in practice.

3 *A quick check of Nero InfoTool shows the drive is now Double Layer copable.*



4 *Although the drive was successfully reflashed, the test disc only burned as for os 22%.*

Is it legal?

DVD drives are sold without licence agreements, so modifying the hardware is unlikely to be breaking any laws. However, any modifications will absolutely void the warranty.

Some manufacturers make their firmware available for free download without licence agreements. In such cases, it's hard to see how installing one drive's firmware on a different model would be breaking the law.

However, downloading firmware that is modified and distributed by a third-party enthusiast site without authorisation is breach of copyright.

Extracting movies

Your friend has made a home movie on DVD, but you want to re-edit or make your own copy. *Jarrod Spiga* explains how to extract the video.

PROtip ★ faster copying

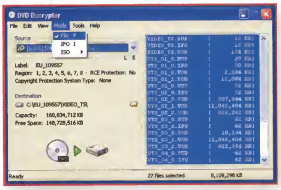
CD and DVD drives have two modes of operation, Constant Linear Velocity (CLV) and Constant Angular Velocity (CAV). If your drive supports the latter, it will spin the disc at a constant rate regardless of where the laser is pointing to on the disc. As a result, data transfer rates are slower when the laser is directed to the beginning (middle) of the disc, and higher when the laser points to the outside. A CLV drive always transfers data at the same rate, slowing down the drive's motor as the laser moves towards the outside of the disc.

Both modes have advantages — drives that operate in CAV mode rip faster, but CLV drives tend to handle errors better. Therefore, if you're going to archive a large number of old and scratched DVDs, ripping with a CLV drive will take longer but will be consistently more successful than a CAV drive.

Inside info

- DVD Demystified FAQ **www.dvddemystified.com/dvdfaq.html**
- DVD Decrypter **www.dvddecrypter.com**
- Doom9 DVD Structure Guide **www.doom9.org/dvd-structure.htm**

Manufacturing defects, disc rot or an accidental scratch can quickly turn a DVD into an expensive coaster. As a result, you may want to back up your non-copyrighted DVD collection using your PC's DVD burner.



1 *A list of files contained within the VIDEO_TS directory will appear in the right pane. Select the files you want to copy.*

EXTRACTING THE DATA

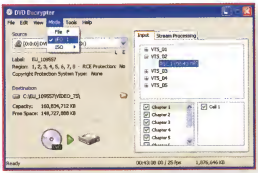
With home DVD editing and authoring approaching the same level of sophistication as commercial DVDs, understanding how to extract video and convert the files requires serious expertise. It's now possible to create everything from titles and subtitles to chapters and sub-chapters on home-made DVDs (to learn more, take a look at the software on page 94). When backing up a DVD, however, you may decide you only want the main title, so there's little point in copying all the menu data. But which files contain what information?

To start with, use DVD Decrypter (**www.dvddecrypter.com**) which lets you view, sort and copy across the relevant video files.

After installing the app, insert the disc containing the footage you want to copy into the DVD drive and load DVD Decrypter. Select the DVD drive and wait for the scan to complete. **1** By default, DVD Decrypter will run in File mode and a list of files will appear. This is where understanding the files on your DVD is crucial.

DVDs contains two directories — AUDIO_TS and VIDEO_TS. The former contains files for DVD-Audio discs, while the latter almost always contains a number of IFO, BUP and VOB files.

Information (IFO) files supply the DVD player with the navigation information for the title, such as chapter points and the location of audio and subtitle streams. Backup (BUP) files are copies of the IFO file and are used in the event that the IFO file is corrupted.



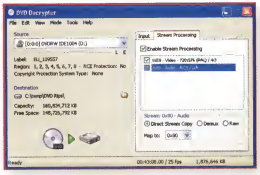
2 *If you have limited hard disk space, select IFO from the mode menu. The right pane will display a tree of the titles available.*

SEPARATING THE FILES

Video Object (VOB) files can contain any number of video, audio and subtitle streams. There might be multiple audio tracks multiplexed in these streams and several video sequences may also be stored. If you have a movie where scenes can be viewed from alternate angles, this stream can also be multiplexed into the same VOB file.

If the DVD was created using the standard DVD-Video format, the video will be encoded as an MPEG-2 stream with a maximum bit rate of 9.8Mbit/s. Audio streams are encoded in a variety of compression formats, including AC-3, MPEG-2 multichannel, MPEG-1 dual-channel and Linear PCM. Together, the audio and video streams must not exceed a bit rate of 10Mbit/s. A maximum of nine audio streams can be used.

In File mode, all files contained within the VIDEO_TS directory will appear in the right pane in DVD Decrypter.



3 *The IFO mode allows you to pre-process the stream as you're copying it. Choose the streams and remap them if necessary.*

Is it legal?

The instructions on these pages are for non-copyrighted home movies only. While it's possible to extract video from commercial DVD-Videos (or any other copyrighted material), this is a breach of copyright and in doing so you risk prosecution. You should not attempt this.

DVD copying has always been a contentious issue. Some consumers believe they should be able to make a legal copy of anything they've purchased, while artists and publishers see it as an excuse to create unauthorised pirated copies of their works.

Not only should you not duplicate copyrighted information, but these DVDs are protected with an encryption and authentication method known as the Content Scrambling System (CSS). CSS is used on most commercial DVDs in order to stop anyone from copying them in this manner. In essence, a CSS-encrypted disc has a key that is located in a hidden sector. This key must be used in order to decrypt the data using special circuitry in a DVD player before streams can be decoded and displayed — or in this case, copied. If you copy the data directly from a DVD, that data will still be CSS-encrypted, and therefore unwatchable.

***APC* does not advocate the practice of circumventing CSS or any other copy protection schemes.**

Because a DVD-Video can contain a number of titles, a player needs to identify each title. While a file's extension allows the player to identify what type of data it contains, the filename is used to separate titles.

The VIDEO_TS.* files are the first ones played when a DVD is launched. The other files make up each title. For instance, VTS_01_1.VOB contains video, audio and subtitle streams for the first title on the DVD. VTS_01_0.VOB is frequently much smaller than VTS_01_1.VOB — in this case, the former contains a set of navigational menus for that title, while the latter contains the actual title.

Video files are played in order. Once a player has finished streaming data from VTS_01_1.VOB, it jumps to VTS_02_2.VOB and so on.

Armed with this information, you can create any DVD-Video, as well as identify which portions of a DVD you want to extract. Look for the title that contains the most data — the more VOB parts there are, the longer the title. If you don't care how much hard disk is consumed, select and copy the whole lot of files.

ANOTHER WAY TO COPY

2 If you have a limited amount of hard disk space available, select IFO from the mode menu. The right pane should now display a tree of the titles available on your DVD.

Expand each title branch and identify the title you want to copy. In most cases, you're looking for the longest title.

You may also deselect which chapters you'd like to copy, which is handy if you're trying to spread a short DVD across a number of CDs.

3 The IFO mode also allows pre-processing of streams as they're copying. On enabling this option, choose which streams you'd like to include and remap them if necessary. This is useful if the video has an extra commentary track.

4 After selecting the title(s) you want to copy, choose the target location. Create or select the directory where you want to copy the DVD data.

5 You should now be ready to rip, so hit the copy button. Watch for read errors during the ripping process and check that your DVD drive is operating at the correct read rate.

6 The resulting IFO and VOB files should be in the specified location. In the example, VTS_02_0.VOB is missing. This file contained the menu for this title, which we chose to strip. Also notice that due to stream processing, our rip takes up 1.46GB of hard disk space as opposed to the 2.08GB of space used on the DVD for the title.

Finally, make sure you've collected *all* the video files. If you accidentally skip any VOBs in the sequence you'll find a gap when it comes time to repackaging the video on your hard drive or on another DVD.

By ripping only the parts of the disk you need, you save time and valuable hard disk space.

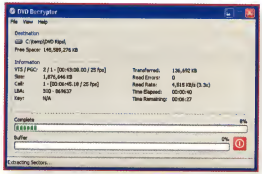
One-step beginner's guide

One-step tools such as DVD Shrink (*www.dvdshrink.org*) can copy, recompress and burn a home movie so that it fits on a regular DVD, or within a specified file size. Use this method if you're not interested in editing, manually compressing or converting your video to other formats like DivX for playback.

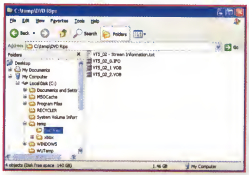
To do this, insert a DVD and load DVD Shrink. Click on the Open Disc button and select the drive that contains your DVD. The applet then scans the DVD for titles and menus. When the scan is complete, uncheck anything you don't want to copy and hit the Backup button.

In order to save the compressed DVD, Nero Burning ROM must be installed (also included on this month's cover CD). DVD Shrink then passes data to Nero, allowing you to write directly to DVD±R/RW media, or to an ISO file on your hard drive.

4 *Select the target location by clicking on the folder.*



5 *During the ripping process watch for read errors. Also check your DVD drive is operating at the correct read rate.*



6 *The resulting IFO and VOB files should be in the specified location when the rip process is complete.*

Processing the video

On the cover CD

Finding hard disk space for home movie DVD backups can be difficult. *Jarrod Spiga* shows you how to save space with different video formats.

PROtip ★ large file sizes

By default, DVD Decrypter splits decrypted VOB files into 1GB chunks. But if you plan to edit VOB files, it's often easier to rip everything into one massive VOB file.

Be aware of the limitations of your file system. FAT16 and FAT32 volumes support a maximum file size of 4GB minus 1 byte. NTFS can take files up to 16T.

For this reason, it's best to rip DVDs to NTFS partitions in Windows 2000, XP or 2003. Windows 98 or Me users are limited to 4GB files.

Linux users should note that the maximum file size supported on ext2 file systems is 2GB, while ext3 has no such limit. Mac OS 9 users are limited to 2GB files, but Mac OS X supports 2T files.

DivX 3.x

✔ Stable; less problematic on dedicated hardware solutions; fast performance..

✖ Complicated to use; making a movie fit a certain size is difficult.

XviD

✔ Open source; simple 2-pass encoding.

✖ Slow encoding; still under development.

DivX 5.x

✔ Free for private use; easy to use; compatible with previous DivX versions.

✖ Pro version comes with adware.

A complete DVD ripped to your hard disk can consume up to 9GB of space — a large amount, even considering the size of modern drives. If you can't write your backup to DVD, it makes sense to compress the backup into a different format in order to free up disk space.

Compressing a DVD isn't for everyone — most standalone DVD players aren't capable of playing DivX or XviD files (although DivX support is appearing on some models — see *APC* July, page 62) and media centre PCs are still a few months away. However, if you have a PC with large screen (or a video card with TV-out) and a good quality sound system, you may prefer watching videos on your PC, where file formats are less of an issue.

WHICH FORMAT IS BEST?

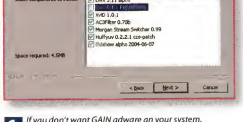
Each format has its advantages and disadvantages (see bottom left).

Although this walkthrough is based on the DivX 5.x codec, the steps are almost identical for any other codec.

OPEN THE TOOLKIT

Before you can compress a ripped stream, you'll need to have the right tools. There are dozens of apps involved, and each performs on its portion of the task at hand.

Hunting down each of these programs has traditionally been difficult, but the Gordian Knot packages make things much simpler. The Rip Pack contains all the tools for compressing video, while the Codec Pack includes all the audio and video codecs you need. Download them from **http://gordianknot.sf.net**.



1 *If you don't want GAIN adware on your system, uncheck the DivX 5.11 Pro codec.*

Start by installing the Rip Pack. The main installer launches separate child installers which allow you to specify more advanced installation options if desired.

1 Next, turn to the Codec Pack. When it comes time to select the codecs that you'd like to install, stop. The DivX 5.11 Pro codec is supported by adware from the Gator Advertising and Information Network (GAIN). If you don't like the idea of installing adware, uncheck the box and install the standard DivX 5.11 codec from this month's cover CD.

Both the Pro and standard versions of the codec allow you to complete the task. The Pro version has a few additional features that can produce higher video quality at the expense of longer compression time. If preserving video quality is paramount, install the Pro version and be aware of its presence when you scan for spyware — removing the GAIN key from the registry stops the Pro version from working.

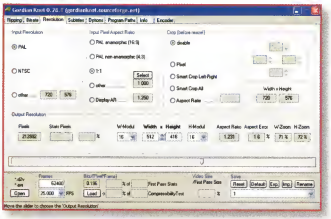
Once you've selected the codecs you want, the main installer will again launch multiple child installers to complete the task.

CODEC CONFIGURATION

Once everything has been installed, load Gordian Knot. The bit rate calculator will be displayed, but configure the codec first by clicking on the options tab followed by the First Pass button under the DivX 5 default codec settings section.

2 *DivX profiles can be used to guarantee that your video will play without a hitch an DivX players.*

3 *Select the audio encoding bit rate. As with any compression method, the higher the bit rate, the better the quality.*



4 *Select the output resolution in the Resolution tab. As the figure increases, so does the image quality and the amount of space it takes up.*

2 If want your video to play on a DivX-certified DVD player or portable device, ensure the profile you select matches the level of certification of the player. Set the Performance/Quality slider to your preferred setting, remembering that slower encoding usually produces a better quality video. Set the variable bit rate mode to Multipass, 1st pass and click on the video tab.

Psychovisual Enhancements is a fancy name for improving image quality on the areas of the screen that the eye typically notices, while reducing quality in the areas the eye does not. Enabling this setting is optional, but can help reduce file sizes. Crop and resize options should be disabled.

Hit OK and replicate the same settings under the Nth Pass button (with the exception of the variable bit rate mode — it should be set to Multipass, nth pass).

AVI ON THE FLY

The DivX encoder only compresses files in an AVI format. In order to convert ripped VOB files to AVI format, load the robot4rip app, located in the Gordian Knot program group in the Start menu. The Scan menu is the key to get started with this application — select the Scan Folder where the VOB files from your home video are stored.

The boxes that appear across the middle of the app indicate the different pre-processing steps robot4rip performs. If you've already extracted a single program chain (PGC), click on the PGC Rip button to disable this step. Hit the start button and let robot4rip create your AVI and D2V files.

UNTIE THE GORDIAN KNOT

Close robot4rip and bring up the bit rate calculator in Gordian Knot again. Click the Open button in the bottom left corner of the screen, and select the D2V file that robot4rip generated. Gordian Knot reads the number of frames within the feature and estimates the frame rate. Ensure this is correct, otherwise the bit rate calculations will be out. PAL video streams are usually encoded at 25fps.

Gordian Knot should now display the feature's duration. Select the video codec for compressing the AVI file (DivX 5 in this case), and adjust the Total File Size to the amount of disk space allocated to the final product. Some handy preselects are available here to make fitting the feature onto one or more discs much easier. If you plan to split the video over two discs, enable the Split final file into CDs option.

3 Select the audio encoding bit rate. Generally, 256Kbit/s is acceptable for high-quality video, but if you're cramped for space, lowering this to 128Kbit/s still produces good results.

By now, you should be able to see what percentage of your file will be taken up with audio, video and overhead data.

4 Next, jump across to the Resolution tab. From here, you can crop your image and select the output resolution. When selecting the output resolution, keep an eye on the Bits/(Pixel*Frame) figure at the bottom of the screen — if it drops too far below 0.180, you'll end up with poor quality video. Naturally, as this figure increases, so does the image quality and the amount of space it takes up.

VIDEO SQUISH

Once you're satisfied, select the Add job button on the Encode tab. Gordian Knot will fill in the required values relative to the details entered in the bit rate calculator. Double-check the DivX 5 and Audio tabs to ensure compression settings are correct and add the job to the Encoding Queue.

Click the Start Encoding button. Encoding can take anything from a couple of minutes to many hours depending on the length of video and the number of compression passes you do. When it's all finished, test the end result and check the file size. With any luck, you'll be pleased with the results. If not, go back to the bit rate calculator and find a better balance.

PROtip ★ finetuning

Selecting the appropriate bit rate is imperative to achieving good quality backups of DVDs. The bit rate calculator in Gordian Knot does a good job of automatically configuring the codec for compression, but it takes practice to get the best results.

In general, enter settings that you don't want to compromise on first, then adjust the less important things. For example, if you must keep a 720 x 576 resolution, reduce the audio quality to 128Kbit/s instead of 256Kbit/s in order to get a 45 minute video to fit on a 700MB disc.

Even if you have to process your files three times to get the right setting, it will be worth it.

Inside info

- Gordian Knot
  http://gordianknot.sf.net
- DivX
  www.divx.com
- XviD
  www.xvid.org
- Online bit rate calculator
  www.digvid.info/digitalvideo/bit rate_calc.php

Moving VHS to DVD

Are your old home movies still on VHS? *Jarrod Spiga* demonstrates how to bring your collection into the digital age.

Many people purchase a DVD writer with the intention of copying their entire home movie archive recorded on analog video tape to a digital format. But burning the end product is only the final step — before you can burn, you need to capture the video.

Look sharp: *a capture device such as this one from Pinnacle is vital for transferring video to PC.*

STEP 1 — CAPTURE CARD

Getting video onto a PC is more difficult than many people realise. Firstly, you need to have a video capture device on your PC. A number of video and TV tuner cards feature analog video inputs — if you have such a card, chances are that it also came with video capture software. Otherwise, you'll need to acquire a video capture card or shell out for a new video card. Keep an eye out for cards that feature both video in and video out (sometimes referred to as VIVO).

STEP 2 — CONNECT VIDEO

The second hurdle is that of port type. Most capture devices feature S-Video inputs, and if your camcorder or VCR doesn't have an S-Video output, you may not be able to transfer the video. If your card has RCA inputs, video can be captured from just about any source but the quality won't be as good as that captured with an S-Video connection.

STEP 3 — CONNECT AUDIO

The final hardware consideration relates to sound. To minimise audio quality loss, a dedicated sound card should be used. For the best results, be sure to disable any audio inputs on the card before capture.

Owners of DV camcorders have another trick up their sleeve. Provided that your PC features a FireWire 400 port, most video editing software should be able to capture directly from the camcorder. You may even be able to connect other devices to your camcorder, using it as a video relay device. But do keep in mind that quality is slightly reduced with every device the footage passes through.

STEP 4 — AVOID FRAME DROPS

The trouble with analog capture is that the system must have enough resources to capture every single frame as it's displayed — generally it isn't possible to slow down the player to allow your PC to catch up. For instance, if another application on your system accesses your hard drive while a capture is in progress, frames may be dropped. Similarly, if there are insufficient CPU resources at the time of capture, more frames will be dropped.

In some cases, the capture software may be to blame — try an alternate capture package to eliminate this. In most cases, however, you'll need to identify the system bottleneck and rectify the problem. Some steps you can take in order to minimise dropped frames include:

- Rebooting your system just before you start a capture session.
- Minimising the number of applications running when capturing.
- Defragmenting hard drives before a capture.
- Using a striped RAID array (RAID 0).
- Ensuring the hard disk is on its own PATA chain, or using a SATA drive.
- Turning off the capture preview function from within the video capture software.

Inside info

- Menalto's Gallery
http://gallery.menalto.com

Disc or drive? Setting up a one-click video gallery

So, you've managed to copy your VHS tape to hard disk. The next step is to burn the footage to DVD using an authoring application. Not only do they copy the files to a DVD format readable by a standalone DVD player, but they also allow you to edit the footage and add menus and themes. Turn to page 94 for a roundup of affordable DVD authoring applications.

Alternatively, if you have a huge number of videos you'd like to have easy one-click access to, you can load them onto your hard drive as a video gallery. There are many free applications on the Web that can catalogue your media collection. Some of these apps are designed to handle images in online photo galleries, but the majority can also be used (or modified) to list and launch all of your videos.

One of the most popular Web applications for the job is Menalto's Gallery. To run it, you'll need to install a Web server (such as Apache or IIS) along with PHP and ImageMagick. Menalto's Gallery is preconfigured to accept a number of video formats including AVI, MPEG and WMV, but it's simple to add support for more formats via the configuration pages.

Adding media is as simple as copying the files to a location on the hard drive that is accessible from within Gallery, selecting the Upload Photos admin option followed by the URL tab, and specifying the directory you copied your videos to. From then on, playing the footage is straightforward. Simply locate the relevant file in the gallery and click on it.

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Primera, the world's leading manufacturer of DVD/CD printing equipment brings to you a full range of professional desktop optical media printing solutions. Single, automatic and now networkable systems for your desktop publishing and small printing operation.

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Home/ small office. 2400dpi. 25 / 50 disc (kiosk) capacity.

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Ideal desktop publishing. 2400dpi. 100 disc capacity

R-Quest print station
Fully networkable printing production line. 220 disc capacity

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Artcoating system

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DVD burners speed or space?

DVD aficionados now have a choice between maximum speed or high capacity, or even a combination of both. *Nick Race* reviews a selection of multiformat drives.

BenQ DW1600

16x DL

Although BenQ recently discontinued this model, it's one of the rare 16x burners on the market and stock should be available for at least the next few months. The firmware has been updated since the first release (reviewed *APC* August, page 45), it's a preview of the speeds you'll see when 16x drives arrive in larger numbers.

A full DVD+R writes in six minutes and five seconds, averaging 11.36x over the 4.7G8 disc. Reading the disc takes nine minutes and 35 seconds at an average speed of 6.24x. CD-R writing takes two minutes and 53 seconds.

Double Layer burning takes 44 minutes and 51 seconds at an average of 2.39x to fill the 8.5G8 disc. For DVD-R support, look out for BenQ's DW1620 and DW1610 (Double and single layer drives, respectively), which will replace the DW1600 later this year.

Details

Contact	BenQ
Phone	(02) 9714 6800
Online	www.benq.com.au
Price	$239
✔	Fast DVD+R burning.
✖	No DVD-R support.
Verdict	★★★★☆

Iomega Super DVD

12x SL

If burning large files isn't an issue, you might want to settle for a single layer-only drive. This Iomega unit supports DVD+R at 12x, DVD-R at 8x, and writes to DVD±RW discs at 4x.

The drive writes a full DVD+R in six minutes and 48 seconds, averaging 10.17x over the length of the disc. Reading a burned disc takes six minutes and eight seconds at an average of 9.79x.

CD-R burn speed is a quick 48x, with CD rewriting at 24x. It takes three minutes and 37 seconds to write a full 650M8 CD-R at an average of 25.28x.

The outstanding software bundle includes Iomega's DVD Wizard, Hot Burn Pro, Iomega Automatic Backup, MusicMatch Jukebox, Sonic MyDVD, Sonic CinePlayer and Adobe Photoshop Album 2.0 Starter Edition.

Details

Contact	Iomega
Phone	1800 466 342
Online	www.iomega.com.au
Price	$269
✔	Excellent CD and DVD burning speeds; strong software package.
✖	No Double Layer writing.
Verdict	★★★★☆

LG GSA-4120B

8x DL

The drive for almost every situation, this LG supports DVD+R at 12x, DVD-R at 8x, DVD rewriting at 4x and DVD+R Double Layer at 2.4x. DVD-RAM is supported at a maximum speed of 5x in Z-CLV mode, the only player in the roundup to support this format.

Performance isn't fantastic, though this might not be an issue if compatibility is your main priority. In testing, a recording time of seven minutes and 49 seconds was recorded, averaging 7.67x over the length of a disc. Reading back the burned DVD takes four minutes and 53 seconds, one of the better results in these tests.

CD write speed is 40x and rewriting is rated at 24x. In testing, the LG takes three minutes and 57 seconds to complete a 650M8 disc.

The GSA-41208 makes up for its lack of burning power with an impressive software bundle. CyberLink PowerDVD and PowerProducer Gold, Nero Express 6 and InCD from Ahead are all included with the drive.

Details

Contact	Sato Technology
Phone	(02) 9748 2999
Online	www.satotech.com.au
Price	$189
✔	DVD-RAM support; great software bundle.
✖	Slow DVD writing.
Verdict	★★★☆☆

Lite-On SOHW-832S

8x DL

Support for large capacity 8.5G8 discs in addition to fast single layer speeds make this drive stand out. DVD+R Double Layer writing is rated at the ubiquitous 2.4x speed, burning a disc in 45 minutes and 15 seconds at an average of 2.36x over the length of the disc.

Despite being only rated for 8x, writing a single layer DVD+R disc to capacity takes nine minutes and five seconds at an average of 7.4x. A burned DVD reads in six minutes and 21 seconds, at an average of 9.25x.

This drive burns to single layer DVD+R and -R discs at both 8x and 4x for rewriting. The drive performs CD writing and rewriting at 40x and 24x respectively. The test disc writes in three minutes and 36 seconds.

This is another DVD drive that comes bundled with an excellent suite of software consisting of CyberLink PowerDVD 5 and an OEM version of Nero 6, comprising InCD 4, NeroVision Express 2 and 8ackITup.

Details

Contact	Synnex
Phone	1800 880 038
Online	www.synnex.com.au
Price	$199
✔	Excellent DVD and CD writing speeds; strong software package.
✖	Relatively slow DL burning.
Verdict	★★★★☆

OptoRite DD1203

12x SL

Tests with this burner show how important choosing the right disc type can be. Like the DD1205 (see right), the DD1203 has problems achieving high speeds with poor media. In addition to 12x DVD+R discs, this drive is rated at 8x for writing DVD-R discs and 4x for rewriting both formats.

The drive writes a DVD+R in eight minutes and two seconds at an average of 7.83x over the length of the disc. Reading a burned disc takes 14 minutes at an average of 4.04x — an extremely poor result. Performance didn't improve with different media.

CD performance is very good with quality discs. The burner is rated at 40x for CD writing and 24x rewriting, and in tests the DD1203 manages to write a full CD-R in three minutes and 13 seconds.

The OptoRite drive comes with a solid software package consisting of Nero Express 6.3 OEM Edition, PowerDVD 5 and Sonic MyDVD 5.2.

Details

Contact	Bluechip Infotech
Phone	1800 803 802
Online	www.optorite.com
Price	$196.90
✔	Good CD performance.
✖	Poor DVD write performance; media compatibility.
Verdict	★★☆☆☆

OptoRite DD1205

12x DL

Not only do you get large file capacity with this drive, but Double Layer speeds are super-fast. The drive fills the 8.5GB DVD+R disc in 42 minutes and 56 seconds, averaging an above par 2.43x. Both OptoRite drives here refuse to burn at high speed rates on generic media, though this unit shines with quality discs.

In addition to 8.5GB discs, the drive writes to DVD+R at 12x, DVD-R at 8x and rewrites DVD±RW at 4x. For single layer burns, this drive takes seven minutes and 12 seconds at an average of 8.16x over the length of the DVD+R disc. With upgraded firmware, disc reads take six minutes and five seconds, well and truly beating the DD1203. CD support extends to 40x for writing and 24x for rewriting, writing a disc in three minutes and 12 seconds in tests.

The drive comes with the same software as the DD1203: Nero Express 6.3 OEM, PowerDVD 5 and Sonic MyDVD 5.2.

Details

Contact	BlueChip Infotech
Phone	1800 803 802
Online	www.optorite.com
Price	$218.90
✔	Great DVD+R DL performance; good CD performance.
✖	Media compatibility.
Verdict	★★★☆☆

Plextor PX712-A

12x SL

Plextor has long been known as a purveyor of high-quality optical drives with stunning DVD performance. The PX712-A is no exception. It burns DVD+R at 12x, DVD-R at 8x, and rewrites both formats at 4x.

The PX712-A records a complete 4.7GB DVD in six minutes and 23 seconds at an average of 10.27x. Nero CD-DVD shows the drive reaches its maximum 12x recording early in the burn process, meaning the drive doesn't struggle to perform at high bit rate burning. Oddly, the drive takes longer to read back the burned DVD — six minutes and 37 seconds at an average speed of 9.05x.

The drive is rated for CD writing at 48x and rewriting at 24x, though the PX712-A doesn't reach its maximum potential in testing. It takes four minutes and 13 seconds to complete a full 650MB CD.

Software is excellent: Nero Express 6, InCD4, BackITup, PowerDVD 5, Power Producer 2 and PlexTools Professional.

Details

Contact	Bluechip Infotech
Phone	1800 803 802
Online	www.bluechipit.com.au
Price	$396
✔	DVD write speed; excellent software.
✖	Slow CD writing; no Double Layer writing.
Verdict	★★★☆☆

Sony DRU-700A

8x DL

This is *APC*'s second look at this Sony drive (see *APC* August, page 45). Double Layer performance is respectable, filling the 8.5GB disc in 45 minutes and 10 seconds at a rate of 2.36x.

The DRU-700A supports 8x burning of both DVD+R and -R media, as well as rewriting at 4x for both disc types. However, the drive is the slowest of those tested here at burning single layer media, taking nine minutes and 18 seconds to burn an 8x DVD+R, equating to an average of 7.17x over the length of the disc.

DVD reading results come in at nine minutes and 13 seconds, or an average speed of 6.15x over the length of the disc.

CD media burns at a top rate of 40x and CD-RW discs at a maximum of 24x. Reading a burned disc takes two minutes and 40 seconds.

The drive's bundled software consists of Nero Burning Rom 6 SE, NeroVision Express 2, BackITup and Showtime, all from Ahead's software stable.

Details

Contact	Sony
Phone	1300 138 249
Online	www.sony.com.au
Price	$299
✔	Great CD performance.
✖	Slower DVD performance.
Verdict	★★★☆☆

How we tested

All drives were tested on an Intel Pentium 4 3GHz (Northwood) PC with 512MB of DDR400 RAM in an AOpen XC Cube AV Edition Small Form Factor PC. Drive speeds and reliability were tested with Ahead Nero's CD-DVD Speed tool version 3.12. DVD+R speed tests were performed using Verbatim and TDK DVD+R discs.

CD tests were performed with Kodak 183-7194 74 minute high-quality gold master discs, Sony 80 minute CD-Rs and low-quality 80 minute generic discs for reliability. Double Layer testing was performed with Philips and Verbatim 2.4x rated DVD+R DL media.

Burn Hollywood, burn

These packages not only burn your movies to DVD, but also allow you to edit and add menus. *Nick Race* dons his director's cap.

How we tested

Comparative testing was performed with six clips in MPEG-1, raw AVI, QuickTime (linear transcoding) and DivX 3 and DivX 5 files. Clips varied between five and 15 minutes long. All software was patched to the latest versions before testing.

A burner comes with basic DVD tools, but there are many authoring packages available which enable the amateur auteur to enhance their home movies with a range of professional effects.

Much has changed since *APC*'s last roundup of DVD authoring software (June 2003, page 76), especially at the lower end of the market. This is excellent news for those who don't want to fork out more than $1,000 for a professional authoring package. The software bundles reviewed here all retail for less than $200 and offer a degree of functionality similar to that found in higher end products reviewed less than 18 months ago.

Features have also improved markedly since then, with more refined menu creation, video editing functions and lots of themes to suit any DVD. The main criteria for evaluating these packages are the ease of use, solid and useful editing tools and wide support for different video codecs. Bonus points are awarded for software that can create logical cascading menu systems and the ability to create chapters from existing long video files. None of the packages here support Double Layer DVD authoring.

Ahead NeroVision Express

Part of Ahead's excellent Nero 6 package, NeroVision Express is an added extra enabling the user to edit, transcode and author video and DVDs. It's a basic program, but it gets the job done through quick previews and a good mix of effects.

The application is laid out in a wizard-style series of pages, each offering a different function, though lacks an overall project view. You can import MPEG, QuickTime, DivX and raw AVI files, and effects, transitions and text overlays can be added, though no proper timeline mode is available. Effects extend far beyond the usual wipes and fades.

Chapter creation is best done manually by watching the footage and adding chapters as required. An automatic chaptering mode is available, but the results are poor.

Automatic sub-menu creation when a chaptered clip is added to the main menu is a nice touch. As with a retail DVD, the sub-menu containing the chapter marks and thumbnails are created and added automatically.

You can add background animations and audio to menus as well as sub-menus. The only downside is that you need to download a 22MB file if you want menu templates.

Ahead are to be commended for creating the fastest and smoothest preview mode. Clips load very quickly and the onscreen controls are equally quick to respond. Transcoding is reasonably speedy and burning to disc is simple.

Details

Contact	Communique
Phone	(02) 9622 5624
Online	www.comm-unique.com.au
Price	$199 (part of Nero 6)
✔	Excellent effects; good preview mode.
✖	No overview of DVD project.
Verdict	★★★☆☆

Apple iDVD

Bundled as part of the iLife suite, iDVD is the authoring side of Apple's iMovie editing application. As iLife is targeted at beginners, iMovie and iDVD don't offer the flexibility of the other software in this roundup. Both iMovie and iDVD are considered together here.

The major complaint with iDVD is that only QuickTime (MOV) files created as linear video tracks can be imported directly into iDVD. There's no support for other popular digital video formats such as AVI (common in digital still and video cameras), MPEG or DivX. There is a workaround — import your AVI and DivX files into iMovie and exporting them as QuickTime — though this doesn't help if you want to use MPEG.

That said, iMovie supports both storyboard and timeline editing modes and a good range of effects and colour transformations. The software doesn't offer any support for automatic chapter creation, so the footage must be scanned through manually or replayed in real time to set appropriate chapter points.

Once film is edited and chaptered in iMovie, a button lets you import your working files into iDVD for creating the menu. You'll find the best range of menu templates among any of the applications reviewed here.

The other strong point of iDVD is the tree structure view which appears once files have been added to the DVD project, making it easier to navigate. A preview mode lets you test the DVD menu before using the built-in burning engine.

Details

Contact	Apple
Phone	13 36 22
Online	www.apple.com.au
Price	$79 (part of iLife suite) or free with new Mac systems
✔	DVD tree structure; excellent templates.
✖	Support for QuickTime footage only.
Verdict	★★☆☆☆

InterVideo WinDVD Creator Platinum 2

With support for devices connected by USB, FireWire or card readers, getting your video into WinDVD Creator 2 is a breeze. It's also easy to edit, with a basic storyboard preview window, letting you check before choosing a clip.

A timeline mode offers more control and facilitates the addition of audio files and text overlays, as well as a large number of transition effects. Transitions are demonstrated in the preview window, making choosing the right look even easier.

Video overlays are available via a right-click menu containing a number of video effects such as emboss, brightening and colour manipulation, though advanced effects such as lens flares are missing. You can also add text overlays with different fade in and out effects and fonts.

Menu creation is a little too basic, with the templates only including Play and Chapters buttons for the main DVD menu. Chapter points are automatically created at the end of each clip in the project; however, the option to create multiple chapter points in longer clips is not provided.

The preview mode takes longer than the other software tested and isn't stable, crashing unexpectedly several times during testing. Final transcoding of the DVD into the end product is also a slow process. WinDVD Creator 2 is able to burn discs directly to DVD, or save the file structure on the hard disk for later.

Details

Contact	InterVideo
Online	www.intervideo.com
Price	US$99.95
✔	Easy to use.
✖	Slow to encode video files; preview mode buggy; basic chapter function.
Verdict	★★☆☆☆

Roxio DVD Builder

highly recommended roxio dvd builder

The installation and software updates can take a considerable time, but Roxio DVD Builder is nevertheless one of the more user-friendly applications here. That's because all the work is done in a single screen, giving you a good idea of the DVD project as a whole.

The software supports a wide range of video files, including MPEG, AVI and QuickTime. Support for DivX is somwhat haphazard, though — you can't use files encoded in DivX 3, but DivX 5 files can be imported.

Once video files have been loaded, editing can be done in storyboard mode. Alternatively, an "Advanced Edit" function is available with a timeline approach. The timeline editing mode shows all relevant information such as existing audio tracks for videos, video effects, transitions and dubbed audio tracks.

Video effects include all the basics, such as colour changes, sound overlays and many transitions. There are also a number of more advanced techniques, like lens flares, swirls, tiles and video shaping. Text overlays allow you to add credits. Chapters can be created either manually or automatically, but the results in automatic mode are more miss than hit. However, sensitivity can be adjusted.

Once the video has been edited, creating a menu is as simple as dragging the clip on to the preview window and renaming the menu options. DVD Builder also supports animated backgrounds, animated thumbnails, menu audio and themes.

Details

Contact	Roxio
Online	www.roxio.com.au
Price	$99.95 (part of Roxio Creator 7 suite)
✔	Good editing mode; excellent range of effects and transitions.
✖	No support for non-chapter sub-menus.
Verdict	★★★★☆

Ulead DVD Movie Factory 3

Simple and effective editing functions and menu creation make Ulead's DVD Movie Factory 3 one of the better entry-level authoring applications currently on the market.

Basic timeline and storyboard video editing functions are built in, letting you select and trim segments from files as desired. The usual array of transition effects, text overlays and video effects is also included.

Chapters for the DVD can be added manually in real time or automatically. However, the automatic mode is next to useless with shorter clips, since the sensitivity of the automatic chaptering cannot be adjusted (unlike Roxio DVD Builder). As a result, a five-minute video clip ends up with the maximum 99 chapters.

A huge number of preset templates makes menu creation simple and effective. A nice touch is the program's ability to skip through the clip and choose a frame to be used as the thumbnail for the menu. This makes a lot more sense than using the first frame, as clips often begin with black fade-ins or other effects that don't describe the contents of the clip.

Movie Factory 3 doesn't support background clips for the menu, though thumbnails can be animated as a teaser.

Once authoring is complete, a testing mode lets you explore the DVD menu and ensure all clips are present and correct. Rendering of the MPEG-2 files for the final DVD is done once the option to burn the DVD is selected.

Details

Contact	Lako Pacific
Online	www.lakopacific.com
Price	$199; upgrade, $165 (part of Ulead Disc Creator suite)
✔	Animated thumbnails; lots of themed menus.
✖	No animated menu backgrounds; automatic chaptering is poor.
Verdict	★★★☆☆

Your free DVD+R

There's no such thing as free these days — except on the cover of *APC*, thanks to this month's joint promotion.

LASER

The free DVD+R on the cover of the magazine is brought to you by LASER, the multimedia and computer accessories brand of import and wholesale company NaSa Multimedia Technology.

The LASER brand has been present in the Australian retail market since the late 1980s. Focused on developing partnerships with Australia's leading retailers, LASER has developed a range of computer accessories for the average consumer that are comparable with, and in some cases better than, those available from the leading brands in the industry.

While LASER is one of the leading suppliers of DVD and CD media in Australia, this is only a minor part of its overall product range. In addition to media it also offers customers a wide variety of product choice in the following categories:

- **Hardware: mobile HDD racks, external cases and KVM switches.**
- **Computer accessories: CD/ DVD storage, internal USB cards, external hubs, keyboards, mice, speakers and media labelling accessories.**
- **Laptop accessories: executive and backpack-style cases, multipurpose locks and desktop stands.**
- **Blank Media: CD-R/RW and DVD±R/RW.**
- **Cables: network, USB and PS/2.**

APC and NaSa Multimedia Technology bring you a DVD+R in a joint promotion to mark the DVD's extraordinary impact on computing. Not only can you now store an entire videotape on one DVD, but for the first time, a real alternative exists to traditional computer backup systems.

WHY DVD+R?

There are two popular write-once formats, DVD+R and DVD-R. We've selected DVD+R because its technical features make it a better proposition for computer usage than DVD-R. However, DVD+R is just one of many recordable formats, and this variety is likely to befuddle some users. To help counter this potential confusion, the table below allows for direct comparison of these formats.

COMPATIBILITY

The majority of standalone DVD players support the DVD-R/RW format. The DVD Forum Web site, at **www.dvdforum.org/forum.shtml** has a list of compatible players.

While not as compatible across standalone DVD drives as DVD-R, most drives sold for PCs today support DVD+R. DVD+R/RW is the format of choice for the big PC vendors.

DVD-RAM is the least compatible of all formats, relying on a cartridge and caddy system. It cannot be used in most standalone DVD players or drives. However, the discs in Version 2 (see table) cartridges can be removed and played in some PC drives or standalone recorders without the caddy mechanisms.

SPEEDS SUPPORTED

- DVD-R: up to 16x.
- DVD-RW: up to 4x (faster speeds in future).
- DVD+R: up to 16x.
- DVD+R DL (Double Layer): up to 4x.
- DVD+RW up to 8x (faster speeds in future, eventually up to 16x).

PROS AND CONS

DVD-R/RW is the ideal format for creating and watching home movies as it can play on the largest number of standalone DVD players. It can also be used for computer data, but is not as strong as DVD+R/RW in this regard.

Newer drives have technical features that make DVD+R/RW better for computer data, such as random read/write and defect management. Crucially, the DVD+R/RW format supports multisession: you can write to part of the disc, then come back to burn more data later. It also supports lossless linking for easier editing of disc contents.

DVD-RAM is widely regarded as the best format for computer data. It can be rewritten up to 100,000 times, making it the most hard disk-like of all the formats, and has random read/write, defect management. Some camcorders can record directly onto the disc, which makes editing easier. The format offers a powerful backup solution to replace older backup hardware. APC

Type	Details	Discs and sizes supported
DVD-R/RW	DVD-R is write once, DVD-RW is rewriteable. DVD-R/RW are the most compatible formats for standalone DVD players (ideal for distributing home movies). DVD-RW can be rewritten up to 1,000 times in ideal conditions. Supported by the DVD Forum, which includes companies such as Pioneer and Apple. The Apple SuperDrive is a DVD-R/RW drive.	DVD-5 (4.7GB): Single sided, single layered. These discs come in two main types: DVD-R for general use and DVD-R for authoring and professional use. DVD-10 (9.4GB): Double sided, single layered. There are plans for DVD-R/RW Double Layer drives.
DVD+R/RW	DVD+R is write once, DVD+RW is rewriteable. DVD+R/RW was formulated to be more compatible across computer drives, hence it has technical features that make it better for storing computer data. DVD+RW can be rewritten up to 1,000 times. The DVD+R/RW format is supported by the DVD Alliance (**www.dvdalliance.com**) which includes Philips and Sony and most of the major computer companies such as Dell, HP and Microsoft.	DVD-5 (4.7GB): Single sided, single layered. DVD-9 (8.5 GB): Single sided, double layered. DVD-18 (17.08GB): Double sided, double layered. Unlike DVD-R/RW, DVD+R/RW can be written in multiple layers, hence the format's larger capacities.
DVD-RAM	DVD-RAM was the first rewriteable format and was created primarily for computer data and applications, although it's just as good at storing movies (Panasonic's DVD recorders use it). Unlike the other formats, it can be rewritten up to 100,000 times, so it's a true alternative to traditional magneto-optical backup drives.	Version 1: 2.6GB or 4.7GB for single sided discs. Version 2: 5.2GB or 9.4GB for double sided discs.

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DVD-R
up to 4x write speed
available with AZO dye

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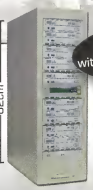

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Internet calling war heats up

Internode will allow customers to make phone calls over home DSL services from early next year, but smaller players are already doing it, writes *Dan Warne*.

Internode is claiming that its Voice over IP (VoIP) pricing is set to "demolish the traditional telco charging model" from early next year. According to the ISP's CEO, Simon Hackett, "Increasingly, we will drop the [long] distance tax out of the voice call."

Internode is currently in the final stages of long-term testing. "With voice, customers have the expectation of dial tone reliability and that's what we plan to deliver," he said.

VoIP services have been available to Australians through US service providers for some time. But using them is similar to talking on a satellite phone: the trans-Pacific round trip for the data adds a minimum of 70ms delay, which is enough to provide noticeable "echo". With normal Internet latencies, it's more like 600ms, which is a little over half a second's delay. Internode will use its existing national broadband network to carry the VoIP calls with no delay.

One company, OzVoip (**www.ozvoip.com.au**), is already marketing VoIP hardware and services to Australian broadband users regardless of their ISP. It resells the services of two companies: MiVoice and ATP, which both offer Direct Inward Dialling — a local telephone number in a major capital city of your choice that redirects through to your IP phone or PC SIP-phone software.

Shout about it: *VoIP means low-cost calls for Internet users.*

Competitive call rates are being offered: MiVoice has nationwide flat rate calls for 10 cents per minute, while ATP charges 15.4 cents for the first 10 minutes and 5.5 cents per minute after that, not to mention unlimited free local calls to other ATP customers.

As always with new technology, as more major players enter the VoIP bunfight we can expect these rates to drop even further.

More exchanges to get DSL

Telstra has announced it will enable 99 more telephone exchanges for broadband, providing the service to 150 towns.

It's the result of the Federal Government's new Higher Bandwidth Incentive Scheme (HIBIS), which gives incentives to telcos to install broadband in regional areas.

Telstra is using the money to reduce the number of people that need to sign on to the company's broadband demand register before an exchange can be enabled. The threshold in some areas is now as low as 35 people.

Find out more about the HIBIS at *www.apcmag.com/info/hibis*. Telstra's demand register can be found at *www.telstra.com.au/demand*.

Your monthly guide to the best deals

APC is proud to partner with the independent broadband monitoring service Broadband Choice (**http://broadbandchoice.com.au**) to bring you the best broadband deals every month.

The comparison table on the following page focuses on ISPs that best serve the majority of *APC* readers' needs. These include coverage in Melbourne, Brisbane and Sydney; 1300, 13 or 1800 telephone support; contracts of 12 months or less; and five or more email addresses.

We've excluded ISPs that meter both uploads and downloads and only listed those that meet at least three of our four plan selection criteria:

- Budget plan: cheapest deal under $30.
- Light plan: cheapest deal under $65, with at least 512Kbit/s speed and 1GB data.
- Family plan: largest download allowance under $90, at least 512Kbit/s and 5GB data.
- High speed: cheapest 1.5Mbit/s plan under $160, with 4GB data minimum.

If an ISP has "unlimited downloads" but speed is throttled after reaching a certain limit, the portion in which you can get full-speed downloads is listed as their limit.

We've picked the lowest price for a contract period of six months or less for broadband installation. Otherwise, the lowest priced option was selected. The installation price doesn't include a modem because you'll generally get better value buying a modem separately. See **www.apcmag.com/web/_0/Get Routed!** for advice on choosing a modem/router.

Can't find your provider in our list? That's because some of the largest ISPs, and many smaller ones, didn't meet our selection criteria.

ISPs enter their own information into the Broadband Choice database. ISPs can contact **bc@whirlpool.net.au** for more details.

Data was extracted from the BroadbandChoice database on 28 July 2004.

Netgear's new modem DSL2+ capable

Netgear (*www.netgear.com.au*) has released a new ADSL modem router, the $159 DG632, which has hardware support for the forthcoming DSL2+ standard. Netgear says that once the new 24Mbit/s standard is ratified in Australia, it will release a firmware update. Not all modems can be upgraded to DSL2+ compatibility because of the need for a faster internal processor.

However, the DG632 only comes with one Ethernet port and one USB port — if you want to connect multiple PCs you'll need to buy a network switch or wireless access point as well.

Tired of sloooooow Internet? Turn the page fast.

BROADBAND DIRECTORY

Name	Phone	Online	Budget plan (under $30)	Light plan (under $65, minimum 1GB data limit, at least 512Kbit/s)	Family plan (under $90, minimum 5GB data limit, at least 512Kbit/s)	High-speed plan (under $160, minimum 4GB data limit, at least 1.5Mbit/s)
AAPT smartchat	13 88 88	www.aapt.com.au	$29.95† 200MB 256Kbit/s	N/A	$69.95† 12GB 512Kbit/s	$99.95† 12GB 1.5Mbit/s
Alphallak	1300 360 638	http://home.alphalink.com.au	$29.70* 200MB 256Kbit/s	N/A	$89 30GB 512Kbit/s	$114.90 10GB 1.5Mbit/s
Australia Internet Solutions	1300 887 877	www.ains.com.au	$24.95* 200MB 256Kbit/s	$59.95* 5GB 512Kbit/s	$84.95 No limit 512Kbit/s	$139.95* 5GB 1.5Mbit/s
Australis Internet	1800 288 871	www.australis.net	$29.95* 200MB 256Kbit/s	N/A	$79.95 25GB 512Kbit/s	$129.95 35GB 1.5Mbit/s
Big Blue	1300 791 789	www.bigblue.net.au	$24.95* 200MB 256Kbit/s	$49.95* 4GB 512Kbit/s	$69.95* 20GB 512Kbit/s	$79.95* 5GB 1.5Mbit/s
Bizmail Broadband	1300 797 774	www.bizmail.com.au	$29* 250MB 256Kbit/s	$49* 4GB 512Kbit/s	$77 No limit 512Kbit/s	$89* 16GB 1.5Mbit/s
Bullet Internet	1300 137 454	www.bullet.net.au	N/A	$59.95* 3GB+ 512Kbit/s	$69.95* 10GB+ 512Kbit/s	$129.95* 10GB+ 1.5Mbit/s
Comcen Internet	1300 300 324	www.comcen.com.au	$22.95* 200MB+ 256Kbit/s	$59.95 15GB 512Kbit/s	$79.99 No limit 512Kbit/s	$89.95 15GB 1.5Mbit/s
Curl Internet	1300 135 908	http://curl.com.au	$24.95* 200MB 256Kbit/s	N/A	$79.95 25GB 512Kbit/s	$149.95 No limit 1.5Mbit/s
DART Internet	1300 305 113	www.dart.net.au	$26.95* 200MB 256Kbit/s	$55 4GB 512Kbit/s	$90 24GB 512Kbit/s	$95 4GB 1.5Mbit/s
DotoCo	1300 880 692	www.dataco.com.au	$25* 1GB 256Kbit/s	$48* 6GB 512Kbit/s	$69* 18GB 512Kbit/s	$89* 15GB 1.5Mbit/s
Dinkum Intarnat	1300 663 400	www.dinkum.net.au	$29.95* 200MB 256Kbit/s	N/A	$79.95 No limit 512Kbit/s	$119.95 No limit 1.5Mbit/s
E-Access	1300 138 810	www.e-access.com.au	N/A	$59.95+ 1.2GB 512Kbit/s	$79.95 12GB 512Kbit/s	$109.95+ 6GB 1.5Mbit/s
E-SOUL	1300 367 258	www.e-soul.net	N/A	$49* 1GB+ 512Kbit/s	$78.80 No limit 512Kbit/s	$89* 8GB+ 1.5Mbit/s
E.Tel Communications	1800 733 888	www.e-tel.com.au	N/A	$54.95* 5GB 512Kbit/s	$76.95 No limit 512Kbit/s	$89.95* 10GB 1.5Mbit/s
Global Dial	1300 130 710	www.globaldial.com	N/A	$59.95 4GB+ 512Kbit/s	$79.95 16GB+ 512Kbit/s	$89.95 5GB+ 1.5Mbit/s
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iINet	13 19 17	www.iinet.net.au	$24.95†* 200MB 256Kbit/s	$59.95 12GB+ 512Kbit/s	$79.95 No limit 512Kbit/s	$89.95 12GB+ 1.5Mbit/s
Internadu	1300 788 233	http://adsl.internode.on.net	$29.95* 300MB 256Kbit/s	$59.95 12GB 512Kbit/s	$79.95 32GB 512Kbit/s	$89.95 12GB 1.5Mbit/s
Interwerks	1300 720 207	www.interwerks.net.au	$29.95* 200MB 256Kbit/s	N/A	$84.95 25GB 512Kbit/s	$119.95 35GB 1.5Mbit/s
IPrimus	1300 851 185	www.iprimus.com.au	$29.95* 300MB 256Kbit/s	$49.95 2GB 512Kbit/s	$69.95 12GB 512Kbit/s	$119.95 12GB 1.5Mbit/s
KeyPoint	1300 550 550	www.keypoint.com.au	N/A	$59.95* 4GB 512Kbit/s	$89.95 No limit 512Kbit/s	$99.95* 10GB 1.5Mbit/s
Nella Networks	1300 884 638	www.nella.net.au	$29.95* 200MB 256Kbit/s	N/A	$69.95 No limit 512Kbit/s	$148.95 20GB+ 1.5Mbit/s
Netspace	1300 360 025	www.netspace.net.au	$29.95* 300MB 256Kbit/s	$49.95 3GB+ 512Kbit/s	$89.95 25GB+ 512Kbit/s	$79.95 4GB+ 1.5Mbit/s
Optraweb	1300 730 720	www.optraweb.com.au	$21.95* 200MB 256Kbit/s	N/A	$79.95 No limit 512Kbit/s	$129 10GB 1.5Mbit/s
OptusNet	1800 504 504	http://broadbandsales.optusnet.com.au	$29.95† 200MB 10Mbit/s	$49.95† 1GB 10Mbit/s	$64.95† 12GB 10Mbit/s	$64.95† 12GB 10Mbit/s
OptusNet	1800 504 504	http://broadbandsales.optusnet.com.au	$29.95† 200MB 256Kbit/s	$49.95† 1GB 512Kbit/s	$69.95† 12GB 512Kbit/s	$118.95† 12GB 1.5Mbit/s
OzEmail Broadband	13 35 93	http://homesite.service.ozemail.com.au	$29.95 300MB 256Kbit/s	$64.95 12GB 512Kbit/s	$64.95 12GB 512Kbit/s	$99.95 12GB 1.5Mbit/s
Pacific Internet	13 36 35	www.pacific.net.au	N/A	$54.95 No limit 512Kbit/s	$54.95 No limit 512Kbit/s	$149* 22GB 1.5Mbit/s
Primus-AOL	1800 265 777	www.primusonline.com.au	$29.95* 300MB 256Kbit/s	$49.95 2GB 512Kbit/s	$69.95 12GB 512Kbit/s	$119.95 12GB 1.5Mbit/s
Spin Internet	1300 303 375	www.spin.net.au	$22.95* 200MB+ 256Kbit/s	$59.95 15GB 512Kbit/s	$79.99 No limit 512Kbit/s	$89.95 15GB 1.5Mbit/s
Swiftbroadband	1300 360 197	www.swiftdsl.com.au	$28.95* 200MB+ 256Kbit/s	$40* 1GB 512Kbit/s	$55* 16GB 512Kbit/s	$85* 16GB 1.5Mbit/s
Tel.Pacific	1300 369 888	www.telpacific.com.au	N/A	$49.95* 2GB 512Kbit/s	$79.95 No limit 512Kbit/s	$119.95* 15GB 1.5Mbit/s
TPG Internet	1300 360 855	www.tpg.com.au	$19.95* 200MB 256Kbit/s	N/A	$79.95 No limit 512Kbit/s	$149.95 No limit 1.5Mbit/s
Veritel Australia	1300 669 869	www.veritel.com.au	$27.95* 200MB 256Kbit/s	$64.95* 1.5GB 512Kbit/s	$89.95 No limit 512Kbit/s	N/A
Web Ace	1800 202 012	www.webace.com.au	$28.95* 200MB 256Kbit/s	N/A	$82.95 No limit 512Kbit/s	$159.95 25GB 1.5Mbit/s
WestNet	1300 555 160	www.westnet.com.au	$29.95* 200MB 256Kbit/s	$59.95 4GB+ 512Kbit/s	$79.95 16GB+ 512Kbit/s	$89.95 5GB+ 1.5Mbit/s

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✔	5	✔	$121 1 mth	✔
✘	5	✔	$125 6 mths	✔
✘	25	✔	$149 6 mths	✔
✔	5	✘	$159.95 6 mths	✔
✘	10	✔	$129 6 mths	✔
✘	5	✔	$150 6 mths	✔
✔	5	✔	$99 6 mths	✔
✔	5	✔	$150 6 mths	✔
✔	5	✘	$143 1 mth	✔
✘	10	✘	$139 3 mths	✔
✔	5	✘	$129 6 mths	✔
✔	5	✘	$139 6 mths	✔
✔	5	✔	$99 6 mths	✔
✔	10	✔	$148 6 mths	✔
✔	10	✔	$99 6 mths	✔
✔	5	✘	$149 6 mths	✘
✔	5	✔	$149.95 1 mth	✔
✘	5	✔	$110 6 mths	✔
✔	5	✔	$89 6 mths	✔
✔	5	✔	$129 1 mth	✔
✔	5	✔	$140 3 mths	✔
✔	5	$4/ month	$99 12 mths	✘
✘	5	✔	$99 6 mths	✔
✔	5	✔	$0 6 mths	✔
✔	10	✔	$129 6 mths	✔
✘	10	✘	$129 6 mths	✔
✘	5	✔	$59 12 mths	✘
✘	5	✔	$59 12 mths	✘
✔	15	✘	$99 3 mths	✘
✔	5	✔	$99 6 mths	✔
✔	7	✘	$149 3 mths	✘
✔	5	✔	$99 6 mths	✔
✘	10	✘	$129 6 mths	✔
✘	5	✔	$149 3 mths	✔
✘	20	✔	$129 12 mths	✔
✔	5	✔	$125 12 mths	✔
✔	20	✔	$0 1 mth	✔
✘	6	$0.83 /month	$99 1 mth	✔

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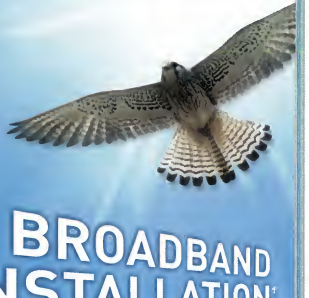
BROADBAND



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WORKSHOP

Hands-on with hardware and software, plus bonus CD content

Bonus CD software

Most Workshop articles are accompanied by bonus software loaded onto our cover CD. Just look for this icon — the software it identifies is often integral to the article. The selection ranges from full-working versions and trial versions to shareware and freeware.

***APC* cannot provide tech support for these programs, but if you have a problem with the CD itself, by all means holler our way (see page 8 for details on how to contact our CD team).**

Site of the month

www.cdfreaks.com

CD Freaks is dedicated to all things related to optical storage, whether they be CD or DVD, media or drives. It plays host to the usual array of news stories, articles and reviews that you'd expect of such a site.

But what makes CD Freaks worthy of inclusion among your bookmarks is its update tracker, which shows a list of recently updated firmware and software. Each version has its own page where users can submit their "reactions" to the update, an invaluable resource for anyone who prefers to err on the side of caution before installing something that could ruin their hardware.

104 Windows XP Secure install
A clean install is a good way to refresh a cluttered Windows XP PC, but essential security precautions need to be taken first. *Mathew Dickerson* safeguards your system from Internet nasties.

108 Windows/Linux Multi-booting
Having trouble deciding whether to install Linux or Windows? *Eric Wilson* and *Jarrod Spiga* explain how, with a little ingenuity, you can run both simultaneously.

110 Linux Email server, part 1
Setting up your own email server in Linux can be a rewarding challenge, as *Anton Tomazin* and *Caroline Leming* explain.

113 Windows Remote assistance
James Bannan demonstrates how to obtain or give help online using Windows XP's Remote Assistance tool.

114 Internet Apache Web Server, part 4
There are times when you'll want to only allow authorised users to access content on your server. *Jarrod Spiga* explains how to restrict access to sections of the Apache Web Server.

117 Windows Virus identification
A virus attack on a Windows PC needn't be a total disaster. *James Bannan* details how to recover from such a situation.

118 Linux Debian, part 4
Andrew Lau and *Jarrod Spiga* introduce the BASH shell and explain how to write scripts to take control of your system.

120 Software MP3 DJ mixing
Having evolved from disc jockey to digital jockey, the new generation of DJs is spinning hard disks, not vinyl. *Daniel Winter* explains how you can do it too.

122 Hardware Water-cooling
The basic principles of water-cooling are simple, but the installation details vary for each system. *James Rolfe* takes you through the installation of a typical water-cooling kit.

124 Handhelds Wi-Fi
Anthony Caruana guides you through the process of getting your Pocket PC wirelessly connected to the Web.

All code fragments and examples given in Workshop articles are for demonstrative purposes only. Questions or comments? Email workshop@apcmag.com.

Worry-free clean installation

A clean install is a good way to refresh a cluttered Windows XP PC, but essential security precautions need to be taken first. *Mathew Dickerson* safeguards your system from Internet nasties.

Bonus CD software
QChain.exe

Skill level
Intermediate

Requirements
Windows XP CD and product key • backup media • Internet access (broadband recommended).

Time to complete
10 hours (2 hours for the secure Windows install)

How long can an unpatched installation of Windows XP survive once exposed to the Internet? To answer this question, a clean installation of Windows XP Home was put on a test system without service packs, patches or virus scanners. After making an image of the installation (so the same clean installation could be reinstated for each test), the system was exposed to the Internet via ADSL, cable and dialup modem.

In all cases, the system was infected with a worm or virus within two minutes — before any security updates could be downloaded, let alone a browser window opened up. In the worst case, the test PC rebooted within 30 seconds of being connected to the Internet after being infected with a Blaster variant.

A variety of attacks were made, ranging from Instant Messenger service pop-ups to a variety of worms and Trojans showing their ugly symptoms, including shutting down the system. If the PC could be used long enough to visit Web sites, various spyware was installed and pop-ups ads would start to appear. Annoying errors occurred in Internet Explorer and software to help eliminate pornography from the hard drive was automatically installed.

Just as disturbing was the volume of traffic generated by unfriendly software. In the worst example, 16,516 packets of data were sent within two minutes of the PC being connected.

LOOKING FOR A SOLUTION

So how do you perform a secure installation of Windows XP? The catch-22 is that you need to connect to the Net to download your updates and virus definitions, but the very act of connecting is enough to infect your PC. Should you avoid infection for long enough to access the Windows Update site, you'll need to download 53 critical updates.

However, steps can be taken to fully patch and protect your machine before it's exposed to the outside world. The best method is to be completely prepared before an installation. If you can't make those arrangements, there are alternatives that will result in a good chance of an infection-free installation.

Two minutes of damage: *a Blaster infection, Instant Messenger spam and an Internet Explorer crash can all accur before critical updates are installed.*

BACKING UP YOUR DATA

Everyone wants their PC to perform as well as it did when it was new. Over time, though, a hard drive becomes cluttered with additional files and slows down. A clean install of Windows will make you feel like you just went out and bought a new PC.

Obviously, data needs to be backed up before you wipe an installation. You should already be backing up your essential data on a regular basis (and storing it off-site) in case of an emergency. But when you wipe the hard drive, you'll also have to back up any other data that you want to transfer to your fresh Windows installation.

Windows XP has a handy utility called the Files and Settings Transfer Wizard (F&STW). It's designed to be a comprehensive, all-in-one utility that backs up all your data, plus your personalised settings, re-creating a Windows environment just the way you like it.

All programs must still be reinstalled on the new computer. Actual programs aren't migrated by the F&STW and it's a good idea to install your programs before you run the wizard on the new installation so that the settings are transferred.

The first step in backing up before using a wizard like this is to have the data organised in a logical fashion. It doesn't have to conform to any specific rules, it just needs to make sense. With all data concentrated in a few specific user areas, the job of backing up and restoring is much easier.

Once the location of all the data is identified, run the wizard and indicate that you're backing up from the old computer. The F&STW can be run on any non-server based Windows operating system to back up data. However, it must be restored on a Windows XP Home or Professional system.

The next step is to select the method of transferring data. It's best to use removable media because it's relatively quick and allows you to store settings on a physical device outside the system, minimising the risk of accidental deletion when it comes time to reformat.

MEDIA MANAGEMENT

If you have a large quantity of data that will be cumbersome to copy to CD, it may be worth investing in a DVD burner. If that doesn't match your data storage requirements, consider an external USB hard drive — it's easy to connect and can affordably store huge amounts of data. USB flash drives are also a very quick and easy way to remove data from a PC.

Now select a custom list of files. Leaving all the default settings intact while adding the locations of your application data is recommended, but deselect the settings you don't want.

Then run the wizard — it creates a file or files containing all your settings and application data at the location you chose. This way you don't have to think about where the various settings for your installation are stored — the wizard works it out.

If you don't fully trust the wizard, copy the most crucial application(s) and data to CD as well — better to be safe than sorry. However, the wizard won't copy your passwords for certain things, such as your ISP details.

SAVING OS SETTINGS

Other items to be backed up manually include the password for your ISP, Windows Product Activation Key and the application used to load the video drivers. Create a list of usernames, passwords and product keys and store them securely on your PC.

If your copy of Windows is already activated and you plan to reinstall it on identical hardware, the following will save you any reactivation troubles.

- Copy C:\Windows\System32\wpa.dbl to your backup location. Also put a copy onto a floppy disk, CD or some other form of removable storage media (it's only a couple of KB in size).
- After the reinstallation of Windows, boot into safe mode by pressing F8 when Windows starts booting.
- Copy the file from your backup to the C:\Windows\System32 directory on the new installation.

Be aware that if you try this on different hardware, you may still have to reactivate.

PREPARING FOR THE INSTALLATION

One of the advantages of preparing for a new installation is that everything can be downloaded and installed before connecting to the Internet for the first time. This means your system can be fully immunised before that crucial first connection. You need to perform the following steps:

1. Visit the Windows Update Catalog Web site (**http://v4.windowsupdate.microsoft.com/catalog/en/default.asp**), which allows you to download the full copies of service packs and patches. Select the appropriate OS that you'll be installing on your system — even down to the service pack that comes pre-installed with your version of Windows. If in doubt, select Windows XP RTM (RTM stands for Release To Manufacture).
- Download the latest version of QChain.exe from this month's cover CD.
- Create a batch file to chain all of the patches together. The syntax of that batch file is:

```
@echo off
setocal
set PATHTOFIXES=D:\QCHAIN
%PATHTOFIXES%\Q123456_x86.exe -z -q
...
%PATHTOFIXES%\qchain.exe
echo QChain has finished applying
patches. Reboot your PC.
pause
```

Where `D:\QCHAIN` refers to the location where you will store all of the updates.

If any of these updates don't use Update.exe as the setup program, you may encounter difficulties in installing them via this script (visit **http://support.microsoft.com/default.aspx?kbid=262841** for more info). However, there's nothing stopping you from testing your batch file before reinstallation — applying a patch when it's already on the system won't do any harm.

The best thing about this procedure is that as new patches become available, they can be added to your QChain directory by including a new line to your batch file.

- Download the latest virus definition files for your preferred antivirus program. Ensure these files are kept separate so they can be burnt to CD.
- Have the motherboard CD on hand for driver files and INF files, but also take the opportunity to download the latest drivers for your hardware. These can be tested on your current installation.
- Burn all files to a CD-R/RW for installation.

OPTIONS FOR THE CORPORATE BOX

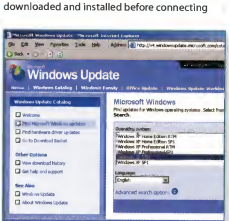
It's possible to create your own slipstream package (see "Creating a system image", APC May, page 130), but the process is cumbersome and clumsy for a single PC and it's hard to justify the amount of time required to create and test such an image. It's a different story if you need to roll out the same image to a number of machines.

You can also perform an unattended installation using an unattend.txt file, but again this is more relevant to a large rollout than a one-off installation. Refer to **http://support.microsoft.com/default.aspx?scid=kb;en-us;314459&Product=winxp** for more information.

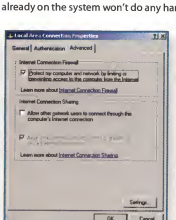
SECURING THE SYSTEM

The secret of any successful installation is good preparation, and the steps for the reinstallation are now relatively simple.

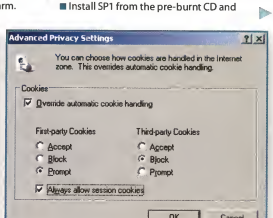
- Install Windows XP from the original CD. This takes 60 to 90 minutes, depending on your hardware. Ensure the system is not connected to the Internet during this process.
- Install SP1 from the pre-burnt CD and



1 *Windows Catalog looks similar to Windows Update, but it allows you to download all patches for installation at a later time.*



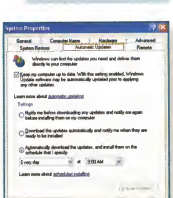
2 *Make sure that your Internet connection firewall is enabled. The firewall under SP2 is much more secure and feature-rich than pre-SP2 versions of XP.*



3 *Change the cookie settings to protect your privacy. If in doubt, prompt — this gives you control on a site by site basis.*

Inside info

- Windows Update Catalog
http://v4.windowsupdate.microsoft.com/catalog/en/default.asp
- Latest version of qchain.exe
http://support.microsoft.com/default.aspx?kbid=815062
- Patches that run with Update.exe
http://support.microsoft.com/default.aspx?kbid=262841
- Slipstreaming software updates
http://support.microsoft.com/default.aspx?scid=kb;en-us;828930
- Slipstreaming driver files into your installation CD
http://support.microsoft.com/default.aspx?scid=kb;en-us;814847
- How to perform an unattended installation
http://support.microsoft.com/default.aspx?scid=kb;en-us;314459&Product=winxp
- Ghost
www.symantec.com/sabu/ghost/ghost_personal
- Drive Image
www.powerquest.com/driveimage
- Scan PCs for viruses without having a virus program installed
http://housecall.trendmicro.com/housecall/start_corp.asp



4 *Set Windows to automatically download and install security updates. This way, you won't have to remember to do it manually.*

▶ reboot. Run the qchain.bat file directly from CD and reboot once all patches are installed.

- Install your preferred antivirus package and update with the signature files on your CD.
- Ensure network card drivers are installed, either from the motherboard CD or the files you downloaded and copied beforehand. Install any other hardware drivers now.

2 Ensure the Windows Firewall is enabled, or install your own firewall software. Under Windows XP SP2, the Windows Firewall is enabled by default. However, under the Retail and SP1 installations, turn on the Internet Connection Firewall from under the Advanced properties of your network card. Use the default settings in the meantime.

3 Change your privacy settings to control cookies. Navigate to Start > Control Panel > Internet Options, choose one of the preset cookie-handling options. Better still, go to Advanced and Block all Third-party Cookies and Prompt for First-party Cookies.

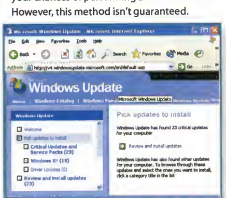
- If you have additional software such as a security suite or spyware removal tools, install them now.

4 You should now have a fully patched and virus-protected system ready to connect to the Net. As a precautionary measure, set up your virus package to automatically update Virus Definition files on a daily basis and set up Automatic Updates in Windows to keep your system fully patched. Finally, activate Windows by copying the wpa.dbl file back into the system32 folder from within safe mode, by manually reactivating.

LACK OF PREPARATION

This installation is secure because all the required files have already been copied to CD. But sometimes you don't have that luxury. If your system is already infected by a virus and nothing seems to be working correctly, it's impossible to download all the necessary files before installation.

If you have no other PC or means of accessing the Net, here are a few basic principles to increase your chances of performing a secure installation. However, this method isn't guaranteed.



5 *For a less secure install, go to Windows Update to install all Critical Updates as quickly as possible.*

- Install Windows XP from your original CD. Ensure the PC is not connected to the Internet during installation.
- Install an antivirus package.
- Ensure network card drivers are installed.
- Go to the Advanced properties of the network card and turn on the Internet Connection Firewall using default settings, as in the first example.
- If you have a hardware firewall or filtering on your router, ensure filtering is enabled.
- Adjust the Privacy settings for cookie handling as described previously.
- Install any additional security software, such as a third party firewall program, security suite or spyware blocker.
- Connect to the Internet and go immediately to your preferred antivirus vendor's site to download and install the latest virus definition files.

5 Go to the Windows Update site and start downloading service packs and patches.

- As a precaution, run another virus scan to ensure the system is clean.

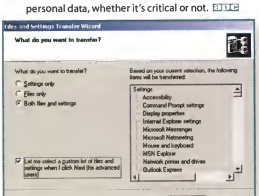
Alternatively, consider using another PC to download the files you need.

RESTORE THE FORMER GLORY

6 Now you're ready to reinstall the software and transfer files from your old configuration using the Files and Settings Transfer Wizard. Add printers, scanners and other hardware, and get your system up and running the way you like it.

Next, image your entire system. Popular applications used to perform this task include PowerQuest's Drive Image (**www.powerquest.com/driveimage**) and Symantec Ghost (**www.symantec.com/sabu/ghost/ghost_personal**). Both applications take a snapshot of the entire system, allowing future reinstallations up to this point to be achieved in minutes.

But if you want to remain security-conscious, the process doesn't finish here. You need to maintain the CD containing the system patches, as well as conducting a regular backup of all of your personal data, whether it's critical or not. ETTP



6 *By selecting a custom list of files to back up, you can have a single archive containing your documents and settings.*

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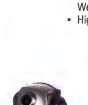

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- Built-in omni-directional microphone
- Supports motion detection
- 16-channel monitoring software embedded

WCS-2003
11g Wireless IP Network Camera

- Complies with IEEE 802.11g standard
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Multi-boot magic

Having trouble deciding whether to install Linux or Windows? *Eric Wilson* and *Jarrod Spiga* explain how, with a little ingenuity, you can run both simultaneously.

Skill level
Intermediate

Requirements
A PC with enough hard disk storage to contain two operating systems.

Time to complete
Varies

Inside info

- GRUB Project
  www.gnu.org/software/grub
- GRUB Manual
  www.mcc.ac.uk/grub/grub_toc.html
- LILO Project
  http://freshmeat.net/projects/lilo
- LILO Mini-HOWTO
  http://tldp.org/HOWTO/LILO.html

Bringing Linux into the fold can be a tricky task on a single PC. While there are plenty of reasons to switch to the open source alternative, a couple of things prevent you from doing so. At home, the kids rebel when they can't play their favourite games and at work, getting all your corporate apps running can be a nightmare. But that doesn't mean you can't have the best of both worlds.

Implementing Windows and Linux together can be trickier than housing multiple Windows installations. Different versions of Windows can mostly (but not always) read each other's disk partitions. On the other hand, Linux often uses a different file system, known as "ext3". There are also differences when it comes to swapping memory allocation — Windows stores all memory pages in swap files, whereas Linux uses more secure swap partitions. As a result, both operating systems need to reside on their own partitions.

WORKING WITH WINDOWS

If you're starting with a sole Windows installation on your system, it probably resides in a single partition that takes up all of your hard disk space. Adding Linux requires either a new hard disk, partitioning software, or a complete re-install of Windows.

Using a second hard disk is the most flexible solution. It allows you to keep each operating system on its own drive and also gives you the flexibility of removing a boot manager from the equation — the system's boot drive can always be modified in BIOS to switch to the other OS.

Disk partitioning software can be used to shrink the Windows partition in order to fit the Linux installation towards the rear of the disk. These tools aren't perfect though, and can create corrupt partition tables — ensure all data is backed up in case you have to re-install everything.

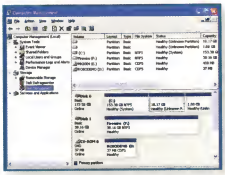
If you have Windows using multiple partitions on one or more drives, you may be able to make enough space for Linux by removing one or several partitions.

Installing Linux requires a few gigabytes of available disk space. The exact amount depends on the distribution and your packages, but a minimum of 4GB should be reserved.

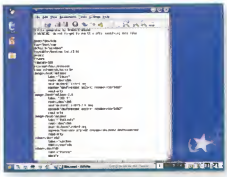
1 To view the configuration of your drives, select Start > Control Panel > Administrative Tools > Computer Management > Disk Management. Partitions may also be removed, created and formatted from this applet. Don't touch any partition labelled "Boot" or "System" — doing so could prevent Windows from loading. And never remove a partition unless all the data it contains is backed up.

Even if you've recovered enough space on your hard disk to install Linux, you could have difficulties booting to it. Older systems have trouble booting to partitions located after the 1,024th cylinder on a hard disk. Double-check your BIOS settings — if the hard disk is set up as a "Large" disk, or configured to use Logical Block Addressing (LBA), you're set. Otherwise, you'll need to rely on a boot floppy to access the Linux installation. Don't change the BIOS settings — doing so can trash the data on your drive.

If you're starting with a blank slate, the order in which the operating systems are installed is crucial. Windows 95, 98 and Me put their own boot "manager" in the boot sector of the hard



1 *View the configuration of your hard drives within Windows using Disk Management. Here, the last two partitions are primed for a Linux install.*



2 *To modify the entries in your Linux baat loader, load the canfig file (either lilo.canf or grub.canf) in a text editar and make the necessary changes.*

3 *Hitting Tab at the LILO prampt shaws a list of all operating systems that can be run. Arraw dawn and select the ane you want.*

disk they're installed on. The term "manager" is used loosely because you aren't given the option to boot to any other OS — it forces you to boot to the Windows OS that was installed.

While other versions of Windows ship with friendlier boot managers, the best move is to load Windows first, then Linux.

BOOT CAMP

During the Linux setup, you'll be asked if you'd like to install the boot manager it uses (usually LILO or GRUB). Answer yes. You'll also be asked if you want to create a set of boot floppies. It's better to be safe than sorry, so answer yes again and have a couple of floppies ready.

Once you've booted into Linux, the first thing you should do is figure out which boot manager is running on your system. Enter the following at a command prompt:

```
dd if=/dev/hda bs=512 count=1
2>&1 | grep LILO
```

If `Binary file (standard input) matches` appears on the next line, you're running LILO. If you're taken straight back to a command prompt, enter:

```
dd if=/dev/hda bs=512 count=1
2>&1 | grep GRUB
```

If you get the desired response to the command, you're running GRUB. If both commands take you directly back to the command line, consult the documentation for your distro in order to determine what your boot manager is.

Both LILO and GRUB run based on the settings provided in a configuration file located in the /etc directory. Lilo.conf contains the settings for LILO and grub.conf is the GRUB guide.

TAKE THE LILO ROAD

2 LILO is the most commonly used boot manager and is much simpler to use. The format of a typical lilo.conf file is:

```
boot = /dev/hda
delay = 10
vga = 0
image = /boot/vmlinux
  root = /dev/hda1
  label = Linux
other = /dev/hda4
  table = /dev/hda
  label = WinXP
```

The top section defines LILO's global parameters and contains information about the disk, where it's located (`/dev/hda`) and how long it should wait before loading the default OS (`delay`).

The second section is loading a Linux OS. The image line refers to the filename of the kernel image that LILO will boot (`/boot/vmlinux`). The first partition on the primary master disk (`/dev/hda1`) is listed as the root partition. Lastly, this OS has been given the friendly label of `Linux`.

The Windows entry is listed in the third section. Since it can't directly load the Windows kernel, LILO goes directly to the partition with the target OS (`/dev/hda4`). The friendly name for this entry is `WinXP`.

3 As soon as the system gets past the POST screen, you should see a LILO prompt. If you hit Tab, the list of operating systems defined in lilo.conf appears. It's then a simple matter of choosing the one you'd like to boot to.

THANKS FOR THE GRUB

GRUB is a more flexible boot manager and allows for the use of better looking menus. While being functionally identical to LILO, the configuration file is more complicated:

```
default=0
timeout=10
splashimage=(hd0,0)/grub/
splash.xpm.gz
title Red Hat Enterprise Linux ES
  root (hd0,0)
  kernel /vmlinuz-2.4.21-
15.0.3.EL ro root=/dev/hda3
  initrd /initrd-2.4.21-
15.0.3.EL.img
title Windows XP
  rootnoverify (hd0,2)
  makeactive
```

As with LILO, the first section is devoted to the way GRUB runs. In this case, a 10 second timeout (`timeout=10`) applies and after this time passes, the zeroth OS loads (in this case, `Red Hat Enterprise Linux ES`). The `splashimage` statement allows you to define the look and feel of your boot menu.

GRUB also lists "friendly" names for each operating system, and can load Linux kernels directly. The `root` statement identifies which partition the root file system resides on.

Note that the way in which drives are referred to is different under GRUB — the first number after `hd` refers to the drive number, while the second refers to the partition number. For instance, `hd0,0` is essentially the same as /dev/hda1.

For the loading of non-Linux operating systems, a couple of different commands are used. The `rootnoverify` statement sets GRUB's root device to the listed partition, indicating that this partition contains the OS that you'd like to boot to. The `makeactive` command sets the active flag on the partition so the system can boot to it.

GOING OS?

Both GRUB and LILO do a good job of booting to most operating systems. However, each boot manager has its own set of caveats and usage options that should also be considered when choosing the optimal booting solution. What's demonstrated here is just the beginning, and the boot loader is much like any other piece of software on your system — there are any number of ways to configure it to perform the task at hand. LTC

GRUB splash screens

GRUB boasts greater functionality when compared to LILO. One of the obvious differences is the splash screen that appears each time your system is booted.

This image can easily be replaced with one of your own — assuming you provide an image that GRUB is capable of handling.

Determine the resolution of your image and enter the following commands to convert it (assuming your image is an 800 x 600 image called "file.jpg"):

```
convert -size 800x600 file.jpg -
resize 640x480 -colors 15
-profile '*' file.xpm
gzip file.xpm
```

Then copy the resulting xpm.gz file to the /boot/grub directory and edit your /etc/grub.conf file. Now search for the `splashimage` line and modify the command as appropriate. If that line does not appear in your grub.conf file, add it below the `timeout` line as follows:

```
splashimage=(hd0,0)/grub/
file.xpm.gz
```

Setting up POP and SMTP servers

Setting up your own email server in Linux can be a rewarding challenge, as *Anton Tomazin* and *Caroline Leming* explain.

In this series . . .

Part 1 — October
Setting up POP and SMTP servers

Part 2 — November
Spam and virus protection

Part 3 — December
Webmail

Bonus CD software

sendmail.8.13.0.tar.gz • dovecot-0.99.10.7.tar.gz.

Skill level

Intermediate

Requirements

Root access on a Linux system • Net connection • Domain name and DNS configured • GNU m4 package installed.

Time to complete

2 hours (approx)

Email is something we all take for granted, but setting up your own server for this purpose can seem daunting. Even those who feel at ease tweaking labyrinthine code may hesitate when it comes to such a task. In the past, this hesitation was justified since it required the editing of cryptic configuration files. Today, a working email server is within easy reach of any intermediate Linux user.

This first instalment of a three-part series explains how to set up a basic email server using Sendmail as the Message Transfer Agent (MTA) and Dovecot for POP3 and IMAP.

Most Linux distributions include some form of package management. Installing Sendmail using the distro-based binary packaged with your distribution is highly recommended. This Workshop focuses on how to build the Sendmail software from source. The basic steps to configure Sendmail from the distro-based binary or source code are more or less the same.

DNS CONFIGURATION

1 A correctly configured DNS is vital to setting up an email server. There are many records in a DNS configuration, but the two most important for setting up a mail server are the A and MX records. The A record converts a hostname to an IP address (the mail server), and the MX record defines the host that accepts mail for a particular domain.

The most efficient way to host an email server is with static IP addresses. If your ISP assigns IP addresses on-the-fly, consider using a dynamic DNS service to ensure mail is always delivered.

INSTALLING SENDMAIL

Sendmail is one of the most powerful MTAs available and current versions include a configuration utility that helps create the sendmail.cf file automatically. You only need to work within the sendmail.mc file, listing features you wish to include in the configuration and specifying parameters for each feature. A Unix utility called m4 then mixes the configuration settings with actual sendmail.cf syntax to produce your personalised sendmail.cf file. A copy of sendmail-8.13.0 is on this month's cover CD.

The first step in the process is to decompress the gzipped tarball and change the directory to a newly created directory:

```
tar -zxvf sendmail.8.13.0.tar.gz
cd sendmail-8.13.0/
```

One of the easiest ways to compile Sendmail is with a Build script. The Build script uses the `uname` command to query which architecture is in use and creates the appropriate Makefile (see **www.sendmail.org/compiling.html** for more info).

2 Next, change to the cf/cf/ directory, copy the generic-linux.mc file to sendmail.mc and build the sendmail.cf and install-cf files:

```
cd cf/cf/
cp generic-linux.mc sendmail.mc
sh Build sendmail.cf
sh Build install-cf
```

Create a new user and group called "smmsp". Then install the Sendmail binary by changing directory back to sendmail/ and running `sh Build install`:

```
cd ../../sendmail/
sh Build install
```

1 *A correctly configured DNS is vital to setting up an email server. The two most important DNS records for setting up a mail server are the A and MX records.*

2 *Sendmail is among the most powerful Mail Transfer Agents available. One of the easiest ways to compile Sendmail is using the Build script.*

3 *The sendmail.cf file is so complicated that it's modness to try and edit it more than once. It's far this reason that the sendmail.mc file exists.*

To start the Sendmail service, type:

```
sendmail -bd -q30m
```

If you've installed a distro-based binary, the server may be controlled via the /etc/rc.d/init.d/sendmail script.

THE SENDMAIL.MC FILE

3 The sendmail.cf file is so complicated that it's madness to try to edit it more than once. That's why the sendmail.mc file exists — it's a lot easier to understand and edit, and enables configuration of most of Sendmail's parameters.

Lines beginning with # in the sendmail.mc file won't be parsed by m4, and will be put directly into the sendmail.cf file. This is useful for commenting on your configuration in input and output files. To put comments into sendmail.mc that you don't want entered into sendmail.cf, use the m4 and dnl tokens. More info on m4 is available from the manual pages (type `man m4`).

The following lines ensure that features such as the pathname of the help and status files, flags needed for the local mailer and so on are properly configured:

```
divert(-1)dnl
VERSIONID('Linux')dnl
OSTYPE('linux')dnl
```

As a spam prevention measure, a number of ISPs block outbound communication on port 25. While this prevents the mail server from communicating directly with the outside world, there's nothing stopping you from using your ISP's SMTP server as a "smart host". This can also relieve your system of complex mail processing, the delivery of external mail, and so on. To define a smart host, look for the following line and edit it accordingly:

```
define('SMART_HOST','smpt.your
.provider')
```

There are dozens of additional lines that appear in the sendmail.mc file, most of which you won't need to concern yourself with for such a basic setup. However, look in <path.to.sendmail.src>/cf/README if you're after a full description for all settings. MAILER declarations should always be at the end of the configuration file.

Now it's time to regenerate the sendmail.cf file and restart Sendmail. This is done by using steps similar to those described earlier — just be sure to kill Sendmail before restarting it:

THE /ETC/HOSTS FILE

It's very important to have a correctly configured /etc/hosts file. Sendmail uses /etc/hosts to determine both the system name and the domains it's responsible for relaying.

You must have a line in /etc/hosts that resolves the fully qualified domain name (FQDN) of the server, as well as an entry for localhost and localhost.localdomain. The server won't function properly if the 127.0.0.1 entry in /etc/hosts doesn't also include `localhost` and `localhost.localdomain`. For instance:

```
127.0.0.1     localhost.localdomain
  localhost
192.168.0.1   mail.mydomain.com
  mail
```

Sendmail will accept responsibility for any hostnames and domains listed in the /etc/mail/local-host-names file.

THE /ETC/MAIL/ACCESS FILE

You can ensure that only trusted users on your network can relay mail through your server using the /etc/mail/access file. The server will only relay mail from PCs that have their email clients configured to use the server as the "outgoing SMTP mail server".

Using this feature prevents the server being used by spam sites to relay mail. While it won't stop spam being received, it prevents others from using your server to propagate it.

The /etc/mail/access file has two columns. Column 1 lists specific domains and IP addresses. Column 2 specifies the action to be taken when mail from these sources is received — that is, OK, DISCARD, RELAY and REJECT. Sendmail will reject any mail relayed to the server that doesn't match any of the entries in this file.

Access can also be set on a per-email-address basis via the /etc/mail/virtusertable file.

To restrict relaying to the server itself and other servers belonging to the same domain, set it as follows:

```
localhost.localdomain     RELAY
localhost                 RELAY
127.0.0.1                 RELAY
mydomain.com              RELAY
```

A server will only be considered part of the same domain if its IP address is found in a DNS reverse zone file.

To allow relaying only for certain hosts (such as a computer with IP of 192.168.1.11), add the line:

```
192.168.1.11              RELAY
```

After changing your access file, rebuild the access database by running:

How your email works

■ **Receiving: each user of your email server has an account, but mail sent to a user actually arrives at the server. Sendmail deposits the item into the mailbox file of the user's account. Users retrieve mail using client software supporting POP3 or IMAP mail retrieval protocols.**

■ **Sending: if mail is for a user within the local domain, Sendmail places the item in the recipient's mailbox for retrieval. If email is sent to an external recipient, Sendmail retrieves the MX record of the domain via DNS and relays mail to the appropriate destination server via SMTP.**

ISPs blocking outbound port 25

Many ISPs block the outbound port 25, which is used for SMTP. This prevents the email server from sending mail unless Sendmail is configured to use your ISP's SMTP server as a "smart host". That way, all mail sent to recipients outside the local network will be sent via the ISP's SMTP server rather than directly from your mail server. This also avoids other potential problems because your ISP's SMTP server can deal with complex mail, and can send email via all sorts of mail transfer types (such as UUCP, Usenet and so on).

Inside info

■ Sendmail
www.sendmail.org

■ Dovecot
www.dovecot.org

■ A Dynamic DNS provider
www.dyndns.com

```
cd /etc/mail

/usr/sbin/makemap hash /etc/mail/
access.db < /etc/mail/access
```

THE /ETC/MAIL/VIRTUSERTABLE FILE

The /etc/mail/virtusertable file tells the server what to do with received mail. Column 1 lists the email address. Column 2 contains either the corresponding user's local mailbox or a remote mail address to forward the email to. For example:

```
user1@domain.com          user1

user2@domain.com
user2@redirect.com
```

Here, mail addressed to `user1@domain.com` will be delivered to the `user1` mailbox. Mail addressed to `user2@domain.com` will be redirected to `user2@redirect.com`.

Like the access file, virtusertable should also be converted to a readable database:

```
cd /etc/mail

/usr/sbin/makemap hash /etc/mail/
virtusertable.db < /etc/mail/
virtusertable
```

THE /ETC/ALIASES FILE

This file can be used to set up simple mailing lists and specify aliases for local users. Column 1 contains mailing lists or virtual mailboxes, and column 2 contains the members of the lists. For instance:

```
# Basic system aliases -- these
MUST be present.

mailer-daemon: postmaster

postmaster:    root

# General redirections for pseudo
accounts.

bin:           root
abuse:         root

# Person who should get root's
mail

root:          user1,webmaster@
domain.com
```

Mail sent to users `bin`, `daemon` and so on will be directed to user `root`. The final line shows that root is an alias for a mailing list with `user1` and `webmaster@domain.com` as members. It's important not to have any spaces between list members in this line as it will produce errors.

For mail addressed to sales@mydomain.com to be forwarded to `user1`, `user2` and `user3`, add the following line to the /etc/aliases file:

```
sales:         user1,user2,user3
```

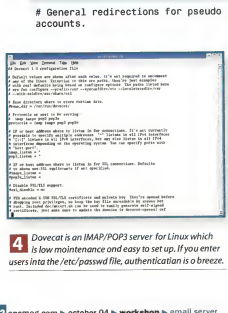
Then convert it into a sendmail-readable database file (/etc/aliases.db):

```
newaliases
```

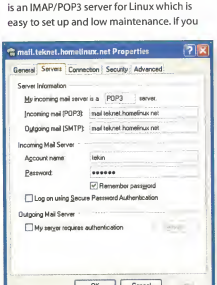
INSTALLING AND CONFIGURING DOVECOT

Sendmail handles mail sent to your domain, and places it in each user's mail folder. In order to retrieve this mail using a mail client such as Outlook, you'll need to make your Linux box a POP3 mail server.

Dovecot (also included on the cover CD) is an IMAP/POP3 server for Linux which is easy to set up and low maintenance. If you enter users into the /etc/passwd file, authentication is a breeze.



4 *Dovecat is an IMAP/POP3 server for Linux which is low maintenance and easy to set up. If you enter users into the /etc/passwd file, authentication is a breeze.*



5 *Sending mail doesn't require authentication. To receive mail via POP3 or IMAP, use the usernome and password for the machine set up as the emoil server.*

4 To install Dovecot under /usr/local, type:

```
./configure

make

make install
```

then rename the configuration file to:

```
mv /usr/local/etc/dovecot-
example.conf /usr/local/etc/
dovecot.conf
```

Make sure the following lines are uncommented and included in dovecot.conf:

```
protocols = imap imaps pop3 pop3s
imap_listen = *
pop3_list = *
```

More information on installing Dovecot and the required configuration settings can be found in its bundled documentation.

To start it up, simply run the Dovecot binary. Again, if you installed a distro-based binary, use the appropriate method to start the service.

New users can retrieve mail using an email client and their local username and password on the Linux email server.

Double-check the configuration to ensure your server isn't set up as an open relay. The /etc/hosts and /etc/mail/access files must be configured correctly for the email server to work. To check the server for open relaying, use a computer outside of your domain and try to send email via your server. If the server is set up correctly, a rejection error will appear.

AUTHENTICATION

5 If you've followed all the instructions correctly, sending mail doesn't require authentication. To receive mail via POP3 or IMAP, use the username and password for the local user account created on the mail server.

You now have a functional email server running on your Linux box. You can send mail from the local machine and any machine you allow via the /etc/mail/access file. Email can also be received from any email client set up to receive messages via POP3 or IMAP from the mail server.

Troubleshooting information can be found in /var/log/messages and /var/log/maillog. LTTP

Assistance from a distance

***James Bannan* demonstrates how to obtain or give help online using Windows XP's Remote Assistance tool.**

Telephone technical support lines and helpdesks aren't the only places you can turn to when you're experiencing problems with your PC. Based on the Remote Desktop Help Session Manager service, Windows XP's Remote Assistance tool is designed to make it easier for users to request, receive and offer help.

ASKING FOR HELP

There are two sides to a Remote Assistance session — the requester and the responder.

Before you can obtain help, Remote Assistance must be enabled to allow requests to be made. To do so, right-click on My Computer and select Properties > Remote and check Allow Remote Assistance invitations to be sent from this computer to start the service. Then select Advanced and enable Allow this computer to be controlled remotely; this allows the person helping you to take control of the desktop from their PC.

It's important to note that Remote Assistance and Remote Desktop are entirely different functions. The latter permits anyone to connect to your machine providing they can supply the correct credentials. The former, on the other hand, is instigated and controlled by you.

To get Remote Assistance running, MSN Messenger must be installed. The latest version can be downloaded from **http://messenger.msn.com**, or from this month's cover CD. If you don't have a login, you can assign a Microsoft .NET passport to any email address you like, including Hotmail addresses. Once signed in, you need to add the person you're going to ask for help to your Contacts list.

To request assistance, click Start > Programs > Remote Assistance. Select the person that you want to obtain help from by highlighting their name under Use Windows Messenger. Then click Invite this person.

The request is sent and is either accepted or declined. Once it's been accepted, a prompt will ask whether you're ready to allow the person to view your screen and chat. Click Yes.

Move your cursor around the screen, and the person you've asked for help will see whatever you see. If you want to talk to each other, you can use the MSN-style chat screen, or even a microphone and headset.

LEND A HELPING HAND

Obviously, you need to be signed in to MSN Messenger in order to give help to others.

As the person giving the assistance, things look a bit different. When a friend requests your help, a typical pop-up appears. Click Accept (or Alt+C) to allow the request. A blank Remote Assistance screen opens on your screen, but more details appear when the requester allows you to view their screen.

At this point, you can't do much more than see what's going on. Both of you have a cut-down MSN Messenger window which allows you to chat, disconnect, send files or alter the settings of the session. If your resolution is too low to see the remote screen properly, select Scale to Window to get a full view.

If all you're doing is giving advice, the chat facility alone is sufficient. However, click the Take Control button at the top left of the screen if you need to get more hands-on. The remote user will be asked if they want to allow this — if they accept, you take the helm but they can see what you're doing.

Control can be terminated by either person at any time by pressing Esc (or any key combination including Esc, such as Ctrl+Esc). Alternatively, click on Release Control.

OTHER ISSUES

If the person requesting help is behind a firewall or NAT device, they need to open up or forward port 3389 for Remote Assistance to work. Additionally, the default XP user Help Assistant must be present. If this user has been erased, the system needs to be restored to a stage when the user was there (using System Restore), or XP SP1 needs to be applied, which resets the user details.

Remote Assistance is a stable and secure method of seeking help that's often much more practical than helpdesks and tech support lines. And it's just as good for business environments as single users. The only downside is that it's almost totally dependent on Microsoft components to work properly. Start customising Windows too much and you may find Remote Assistance is no longer an option. STIT

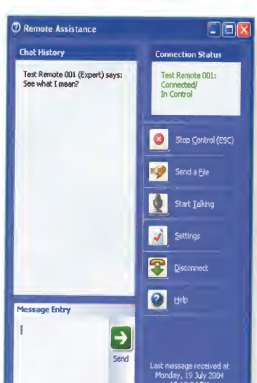
On the cover CD

Bonus CD software
MSN Messenger 6.2

Skill level
Beginner

Requirements
Windows XP

Time to complete
30 minutes (approx)



Control the problem: *Remote Assistance allows you to view and take control of the desktop of the person asking you for help.*

Apache lockdown

There are times when you'll want to only allow authorised users to access content on your server. *Jarrod Spiga* explains how to restrict access to sections of the Apache Web Server.

In this series...

Part 1 — July
Installing the Apache Web Server

Part 2 — August
Getting Apache to do what you want

Part 3 — September
Apache's secrets unlocked

Part 4 — October
Apache lockdown

Part 5 — November
Troubleshooting

Inside info

- Apache 1.3 Authentication documentation
http://httpd.apache.org/docs/howto/auth.html
- Apache 2.0 Authentication Documentation
http://httpd.apache.org/docs-2.0/howto/auth.html
- mod_auth_mysql
www.dlegonet.com/support/mod_auth_mysql.shtml
- mod_authn_dbi
http://open.cyanworlds.com/mod_authn_dbi

Skill level
Intermediate

Requirements
An installation of the Apache Web Server.

Time to complete
1 hour (approx)

Almost everyone has visited a Web site that has required a username and password in order to access content. Supply valid credentials and the server will forward the requested file. Failure to offer a recognised password and username can result in a 401 (Unauthorised) error message.

It often makes sense to restrict areas of your server for certain purposes. It might be because you want to prevent the general public from accessing confidential information, or because you want to hide your Web-based video gallery (see "Disc or drive?", page 90, for more information on video gallery creation).

MANAGING HTPASSWD FILES

The easiest way to restrict access to your server is through the use of files created with the `htpasswd` command. Setting up this method of authentication requires two steps: the creation of a file that stores user credentials, and configuring Apache to use this file.

The file that stores user credentials can be given any name, but must contain only one username per line. Each password is hashed to prevent others with access to the file from finding out everyone else's password.

To create a file and add the first user to it, type in:

```
htpasswd -c <filename> <username>
```

After hitting Enter, you'll be prompted to key in a password for that user. The `-c` switch is specified to create the file. To create additional users, the `-b` switch should be used as follows:

```
htpasswd -b <filename> <username>
```

For Apache 2.0.46 or later, users can be removed from the file by specifying the `-D` switch. Note that this is an upper case "D" designed to prevent the accidental deletion of users:

```
htpasswd -D <filename> <username>
```

Alternatively, if you're using an earlier version of the Apache Web Server, you can edit the password file with the editor of your choice by removing the line containing the username you want to delete.

After you've set up the password list, Apache must be configured to use it. Authentication methods are usually placed over entire directories, so the following block of code could be placed within an .htaccess file or within a <Directory> block in the httpd.conf file:

```
Satisfy All
AuthName "APC Magazine :: Login"
AuthType Basic
AuthUserFile /path/to/filename
Require valid-user
```

If you use the same htpasswd file for a number of locations and only want certain users within the file to have access to a particular resource, replace `Require valid-user` with:

```
Require <user_1> <user_2> ...
```

USING DIGEST AUTHENTICATION

The biggest weakness regarding the use of htpasswd files lies in how credentials are transferred from client to browser. When a client authenticates with the server, the password exchange is not encrypted in any way and is sent via plaintext. This gives malicious users the chance to intercept the password en route to the server, allowing them to use the credentials.

One solution is to use digest authentication. This forces the client browser to send an MD5 hash of the username, password and realm in order to mask the input credentials. The one drawback of this method is browser support. While most modern browsers support digest authentication, some don't, so the platforms your visitors use may force you to adopt a more basic authentication method.

The process for setting up a digest authentication password file is similar to setting up an htpasswd file. To create the file and insert the first user:

```
htdigest -c <filename> <realm> <user-name>
```

After entering the command, you'll be prompted to enter a password. In order to add further users to the same file, use:

```
htdigest <filename> <realm> <username>
```

Apache also needs to be configured to use digest authentication as opposed to basic. The

AuthType directive must be changed to:

```
AuthType Digest
```

WEAK VERSUS STRONG

Entering credentials into a window is called weak authentication because it's possible for unauthorised users to obtain these same credentials and log in using them. A strong authentication credential is generally more difficult for unauthorised users to meet. For instance, limiting access to a range of IP addresses is the most common way that strong authentication is implemented.

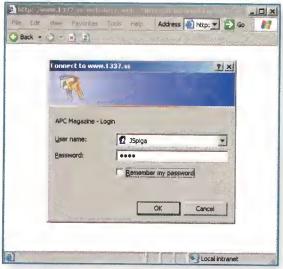
For example, if you've set up a section of your Web server for an intranet that will only be used by people connecting from your local network, you should also set up an htpasswd file that limits what users can access on the site. In this case, you'd need to implement both strong and weak authentication methods.

The following could be inserted in a .htaccess file or within a <Directory> block in your httpd.conf file:

```
Satisfy All
AuthName "Text"
AuthType Basic
AuthUserFile /path/to/filename
Order deny,allow
Deny from all
Allow from 192.168.1
```

With this code in place, a client will be prompted for their username and password whether they come from a valid IP or not. If authentication cannot be confirmed, an Unauthorised (401) error message will appear. If valid credentials are supplied, the next test occurs.

The second last line of code specifies that all users will be denied access to the resource by default, while the last line grants access to any user who has been authenticated via login credentials, provided they are using a PC on the 192.168.1.x network. Therefore, if the client has authenticated from a host that's not on the 192.168.1.x address range, they'll receive a Forbidden (403) error.



Hoi! Who goes there: *forcing users to enter credentials to access content is a good way to keep your data private.*

SATISFACTION GUARANTEED

When you implement authentication in a directory, the same authentication method applies to all files and subdirectories contained within that directory. However, there will undoubtedly be occasions where you'll need to lift restrictions on some ▶

With DYMO LabelWriter there's no more off-register printing, no more waste. It plugs into your PC or Mac and sits on your desk printing up to 32 perfect labels a minute. It has its own software and links with other popular software too. Choose from up to 40 label types (address, shipping, CD/DVD, file folders, you name it), print one label or hundreds. Check it out on our website – **www.dymo.com.au**

DYMO LabelWriter
DYMO saves you TYMO

RMKE9363

resources within this tree. The following could be used in a .htaccess file located in a certain subdirectory to prevent the authentication method from being inherited from a parent directory:

```
Satisfy Any
Order Deny,Allow
Allow from all
```

In similar fashion, if you want to remove authentication inheritance from a specific file, use the following:

```
<Files index.html>
Satisfy Any
Order deny,allow
Allow from all
</Files>
```

In these cases, the `Satisfy Any` directive instructs Apache to accept any authentication, whether weak or strong. Below this directive, a strong authentication method has been defined. `Allow from all` grants access to everyone, thereby meeting the requirement of the Satisfy directive, and removing the need to supply authentication credentials.

STORING CREDENTIALS IN A DATABASE

Storing usernames and passwords in plaintext files is a long way from being the most secure solution. Anyone who has access to those files can easily identify valid usernames for the resource, meaning that half of the hacking objective is already done. A more secure way to store credentials is by placing them within a MySQL database.

Setting this database up is a relatively straightforward task. However, different procedures exist for the different versions of the Apache Web Server.

Regardless of which version of Apache you use, the first step is to create your database and then a table within that database. It's easiest to use a tool such as phpMyAdmin, but if you have to resort to using a command prompt, enter:

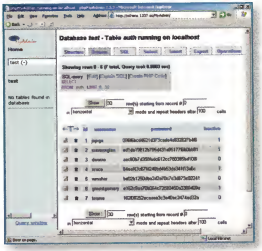
```
% mysqladmin create
<db_name>
% mysql <db_name>
mysql > create table <ta-
ble_name> (
-> username char(25),
-> passwd char(25),
-> groups char(25),
-> isactive tinyint(1),
-> primary key (username)
-> );
```

Next, you have to tell Apache to use the database. Under Apache 1.3, this is done by using mod_auth_mysql (a module specifically designed for administering authentication with MySQL databases) before a <Directory> block in httpd.conf:

```
Auth_MySQL on
Auth_MySQL_Info <host-
name> <db_user> <db_pass-
word>
Auth_MySQL_General_DB
<db_name>
Auth_MySQL_Password_Table
<table_name>
<Directory /path>
AuthName "APC Magazine :
: Login"
AuthType Basic
Require valid-user
</Directory>
Auth_MySQL off
```

Under Apache 2.0, a different module has been created in order to offer support for storing credentials in other databases, as well as in MySQL databases. The mod_authn_dbi module uses the libdbi package as a backend to accomplish this. A different syntax is also used under Apache 2.0 to cater for this module:

```
AuthnDbiDriver <config_name>
mysql
AuthnDbiHost <config_name> <host-
name>
AuthnDbiUsername <config_name>
<db_user>
AuthnDbiPassword <config_name>
<db_password>
AuthnDbiName <config_name>
<db_name>
AuthnDbiTable <config_name> <ta-
ble_name>
AuthnDbiUsernameField <config_
name> username
AuthnDbiPasswordField <config_
name> passwd
AuthnDbiIsActiveField <config_
name> isactive
```



User database: *Apache can look up user information from MySQL databases. Just make sure that access to the database is restricted.*

```
AuthnDbiConnMin <config_name> 3
AuthnDbiConnSoftMax <config_name>
12
AuthnDbiConnHardMax <config_name>
20
AuthnDbiConnTTL <config_name> 600
<Directory /path>
AuthType Digest
AuthName "APC Magazine :: Login"
AuthBasicProvider dbi
AuthnDbiServerConfig <config_
name>
Require valid-user
</Directory>
```

where `<config_name>` refers to a name used to ensure that all variables passed on to the mod_authn_dbi module are applied to the correct configuration. This module supports the use of multiple configurations simultaneously, allowing for great flexibility. For instance, it lets you create two configurations that use different database technologies, or allows for two configurations that use different tables within the same database.

Once Apache is querying the database, the users have to be added to the database. For a complete rundown on Apache 1.3's mod_auth_mysql module, see **www.diegonet.com/support/mod_auth_mysql.shtml**. Apache 2.0's mod_authn_dbi module is still under development, and documentation for it is difficult to come by. However, **http://open.cyanworlds.com/mod_authn_dbi** is a good place to start.

On the mend

A virus attack on a Windows PC needn't be a total disaster. *James Bannan* details how to recover from such a situation.

When your machine starts rebooting and your inbox is filling up with emails titled "Re: Hello", you've probably copped a virus. But installing a virus scanner at this stage isn't enough, as many viruses are clever enough to hide themselves or even prevent virus software from functioning properly. So what can you do?

DIAGNOSIS

What's the difference between an innocent error message and a virus? With a dodgy application, the error should be consistent and reproducible. A virus is more subtle, or at least it's supposed to be. Blatant symptoms such as reboots are caused by faulty code within the virus causing a Windows component to crash (such as Sasser). These viruses are easier to troubleshoot as they usually give a specific error message and the effect is obvious. Symptoms of other viruses include:

- Windows taking longer to load. Some viruses activate on startup before the OS loads properly, extending the boot time.
- Unfamiliar processes running. From the Processes tab in Task Manager (Start > Run > taskmgr), you can view a list of the apps that are running. Then, run regedit and navigate to HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Run. This gives a list of the apps launched on startup. Any processes which look unfamiliar or don't relate to any installed application should be regarded as suspicious.
- Applications failing to load. Some viruses prevent programs (such as virus scanners and regedit) from running, which can be used to track them down.
- Hard drive constantly reading. Although this is more likely evidence of a fragmented drive, if the HDD LED is constantly on, Windows is working overtime.
- Email inbox filling with junk.
- Undeliverable email. If you're receiving bounce-back replies to email you didn't send, your machine is almost certainly being used as a platform for launching viruses.
- Network/modem connection always busy. Check the connectivity lights in the system tray. If they're on all the time, even when idle, your machine is sending/receiving information in the background.

STOMP THOSE NASTIES

If you suspect your PC is infected with a virus, figure out which one is giving you grief. Online virus libraries are the best sources of information. These are databases maintained by the main antivirus/security companies and contain a catalogue of virus threats. The most frequently used libraries are located at:

- **http://securityresponse.symantec.com/avcenter/vinfodb.html**
- **http://us.mcafee.com/virusInfo/default.asp**
- **www.viruslist.com/eng/viruslist.html**

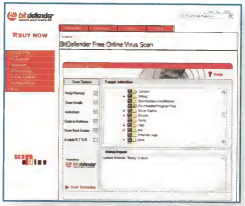
If you find information relevant to the problems you're experiencing, the next step is to neutralise them. Installing an antivirus package won't be effective enough, but there are a few other options available:

- Most viruses have a recommended removal method. This will be documented in each online library reference and generally involves booting into Safe Mode, editing the registry and possibly deleting system files.
- Use a removal tool. Wherever possible, security companies will create specific virus removal tools which are very effective. Download the relevant tool for your identified virus and run the application. You may need to do this in Safe Mode.
- Use an online virus scanner. These are free services offered by various companies. You have to allow the remote server to install whatever it needs onto your machine — usually an ActiveX control or Java applet. This gives the remote server access to your local files and lets it perform a thorough scan. See "Inside info" for a list of online scanners.

SAFE, NOT SORRY

If you hit F8 during Windows' boot process, you'll see a boot menu. Safe Mode is great for running virus checks as a minimal driver set has been loaded, hardly any services are active and Windows isn't holding onto as many files. Some viruses can only be removed in Safe Mode.

However, prevention is better than cure and nothing beats an up-to-date computer with the latest virus signatures. But don't despair if you run foul of an Internet nasty. The road to PC health requires a bit of manual effort, but there are plenty of ways to cure those infections. APC



Online scan: *even if you don't have antivirus software installed, a number of online scanners can identify nasties on your system.*

Skill level
Beginner

Requirements
Windows • Internet connection.

Time to complete
Less than 1 hour

Inside info

- McAfee
  http://us.mcafee.com/root/mfs
- Trend Micro
  http://housecall.trendmicro.com/housecall
- Panda ActiveScan
  www.pandasoftware.com/activescan
- BitDefender
  www.bitdefender.com/scan
- RAV AntiVirus
  www.ravantivirus.com/scan
- Symantec
  http://security.symantec.com/sscv6

Debian for advanced uses

***Andrew Lau* and *Jarrod Spiga* introduce the BASH shell and explain how to write scripts to take control of your system.**

In this series . . .

Part 1 — July
Debian installation walkthrough

Part 2 — August
Using Debian and X-Windows

Part 3 — September
Becoming familiar with Debian

Part 4 — October
Debian for advanced uses

Skill level

Intermediate

Requirements

***APC* June Debian 3.0r2 DVD.**
If you don't have the June issue of *APC*, you can purchase the DVD by sending a cheque or money order for $6 (including postage and handling) to:
APC Debian DVD
Attn: Helen Chen
***APC* Magazine**
PO Box 4088
Sydney NSW 1028

Time to complete

2 hours (approx)

Inside info

- Advanced BASH Scripting Guide
  www.tldp.org/LDP/abs/html
- BASH Scripting FAQ
  www.splike.com/howtos/bash_faq.html

When designing an application with a graphical user interface, programmers have to anticipate all the possible ways in which a user will interact with it. No matter how intuitive and user-friendly this may seem, it constrains the user to working only in predicted ways. This is fatal when they have to deal with unforeseen tasks and circumstances.

Thankfully, Linux lives up to the Unix philosophy and includes many small, simple tools that each perform a single task well. Through the use of shell scripts, these tools can be combined to solve almost any complex task as a series of simple operations.

BOURNE AGAIN

Shell scripts consist entirely of commands you'd otherwise execute in a terminal. Since scripts can be written in many different languages and each needs be handled differently, the first line of any script should point to an interpreter that can understand and run it.

The default shell provided with almost every distribution of Linux is called the GNU Bourne Again Shell, or BASH. Thus, the first line of a script should contain:

```
#!/bin/bash
```

In order to run a script from the command line, it needs to be made executable. Assuming the script is called "hello", this can be done using:

```
$ chmod +x hello
```

Then run the script by typing:

```
$ ./hello
```

VARIABLES AND ARGUMENTS

User-defined shell variables can be used to hold strings of characters. Unlike many programming languages, there's no need to declare them beforehand. You can start using them by assigning a value to an alphanumeric name.

To retrieve a variable's stored value, precede the `name` by a `$`. For instance:

```
#!/bin/bash
name=Andrew
echo $name
```

If you need to combine a variable with more characters, braces should be used around the variable in order to disambiguate, otherwise the shell will mistakenly believe you are referring to another variable. For example, `${x}y` should be used to echo the contents of `$x`, followed by the letter `y`. Also, avoid spaces around the equals sign.

To treat a variable as a number instead of a string, a pair of parentheses is required. The following example will return a result of 3:

```
x=1 y=2
echo $(( $x + $y ))
```

If a variable containing a string is treated as a numeral, the value of that numeral will be zero.

Arguments are inputs passed on to your script at the time it's run. Access them by using some of BASH's built-in shell variables (see the table on page 119). For example, assume that you have the following script, named "bigfiles":

```
#!/bin/bash
du -ak $1 | sort -nr
```

This script reports the disk usage (`du -ak`) of all files within the directory passed into the script by the first argument (`$1`). It then sorts the result in reverse numerical order (`sort -nr`), so that the biggest files appear at the top of the list. To make this script generate a report for the /var/log directory, the following command is used:

```
bigfiles /var/log
```

CONDITIONALS

The above example is fine if you want to run commands in sequence, but what happens if commands should only be run when certain conditions are met? Like any programming language, conditional statements can also be used in scripts to alter the flow of execution. The most basic of these is a regular `If. . . Then. . . Else` statement. For instance, the following could be used to ensure that arguments have been passed to your script:

```
if [ $1 = start ]
  then
  echo "Process is starting..."
else
  echo "Process terminating!"
fi
```

The drawback with If... Then... Else... statements is that they are binary — either something equals another thing or it doesn't. If you need to match a range of conditions, the case statement should be used. In a similar example:

```
case "$1" in
start)
echo "Process is starting..."
;;
stop)
echo "Process terminating!"
;;
*)
echo "Usage: script {start|stop}"
;;
esac
```

ITERATION

Looping through a sequence of lines is the other form of control structure in procedural programming. Shell scripts also have the ability to do this. `while` loops are often used to loop through a section of code as long as a certain condition is met.

The following script counts down each second, for the amount of time specified by an argument. It does so by running the code located between `do` and `done` lines, so long as `count` is greater than `0`:

```
count=$1
while [ $count -gt 0 ]
do
  echo $count
  let count=count-1
  sleep 1
done
```

A similar loop is the `until` loop. This runs until a certain condition is met, as opposed to running while a condition holds true. The above script could be modified to incorporate an until loop as follows:

```
count=$1
until [ $count -lt 1 ]
do
  echo $count
  let count=count-1
  sleep 1
done
```

The last iteration method that can be used, and the most useful, is a `for` loop. This works through a list, executing the code contained within the loop once for each item, and then terminating. The above example could be rewritten to incorporate this counting loop as follows:

```
for (( count=$1 ; count ;
count=count-1 ))
do
  echo $count
  sleep 1
done
```

A for loop starts its operation by evaluating the first expression (the variable `count` is assigned the value supplied to the script as an argument). The loop then evaluates the second expression (that is, it checks if count is equal to zero) to see if the loop should be executed.

If this evaluation proves false, the commands between `do` and `done` are executed (the value of count is echoed to the screen, and the process waits one second). After the instruction execution has completed, the third expression is evaluated (the value of count is decremented), and the second expression is then re-evaluated.

For loops may also be used to process lists of strings. For instance, if you have a list of capital cities on the eastern seaboard of Australia and each string has to be echoed to the screen, the following could be used:

```
for cities in Brisbane Sydney
Melbourne
do
  echo $cities
done
```

This basic example prints the name of the three cities to the screen, each on a new line. A more practical example would be to create a copy of all files within a directory, and append a `.bak` extension to each one:

```
for file in $*
do
  cp $file $file.bak
done
```

COMMAND SUBSTITUTION

Another powerful feature is command substitution. This allows you to use the output of an executed command within your script — more flexible than piping or redirecting output. Command substitutions are surrounded in back quotes (`).

As a practical example, consider the following script named "search":

```
#!/bin/bash
if [ $# -eq 0 ]
then
  echo "Usage: search {string}"
else
  grep -l $1 `find . -name "*"
-type f`
fi
```

Provided a search string has been supplied to the script, the command contained within back quotes is executed first (the `find` command lists all files within the current directory). The output from this command is then used to execute the rest of the statement (`grep` removes all lines not containing the search string).

EXIT 0

This Workshop has only covered some of the BASH shell's most basic features. To learn more, take a look at the Advanced Bash-Scripting Guide (**www.tldp.org/LDP/abs**) or the manual page for BASH.

Built-in shell variables

$*, $@	all of the arguments together and separately respectively
$#	argument count
$?	return value of the most recent command
$-	current option flags
$$	process ID of the shell script
$!	process ID of the most recently executed background process
$0	the name of the shell script
#_	the absolute filename of the shell script
$n	the nth command-line argument (1-9) only

Reinventing the DJ

Having evolved from disc jockey to digital jockey, the new generation of DJs is spinning hard disks, not vinyl. *Daniel Winter* explains how you can do it too.

The rise of the DJ as cult hero implies that there is more to it than just playing records. In recent years, many DJs have migrated from vinyl to CD and, with the advent of specialised software, some only mix digitally on laptops.

On the cover CD

Bonus CD software

MixVibes 5 Free (Windows) • MixVibes 5 Pro demo (Windows) • Traktor DJ (Windows/ Mac OS X) • Virtual DJ MKIII (Power Macintosh) • DJPlay (Linux).

Skill level

Intermediate

Requirements

MixVibes 5 Free (Windows) • MixVibes 5 Pro demo (Windows) • sound card (two recommended) • speakers and/or headphones.

Time to complete

2 hours (approx)

PREPARING THE MIX

This Workshop demonstrates how you can use MixVibes 5 DJ software to mix, match and loop MP3s into sets for live performance or for burning to CD. The first step is to configure the software and prepare some MP3 files for the mix. With this groundwork laid, the basic techniques of tempo synchronisation and cross-fading can be explained. Then more advanced techniques available in the registered version of MixVibes Pro can be explored, like using kill frequencies, sampling loops and scratching with vinyl effects.

1 Install MixVibes 5 Free (included on this month's cover CD), fire it up and click every orange icon in the toolbar to enable all windows on offer. In the Explorer pane on the left-hand side, browse for MP3 files and drag them into the playlist window at the top of the screen. Alternatively, use the scan feature to have MixVibes automatically locate MP3s for you.

2 Once a few files have been queued in the playlist, drag a different track onto each of the playback units ("decks") in the centre of the screen. You'll be able to play these files using the controls, just like any other media player. The difference here is that both players are side by side, allowing you to cross-fade between the two using the slider at the bottom of the screen. Experiment with the cross-fader to familiarise yourself with the deck controls. If you can't hear anything, check the sound card settings in the Control Panel — MixVibes uses the default audio preferences for your system.

The most basic principle with DJing is to synchronise the two decks so that both selected tracks are playing at the same tempo with the beats matched. Start with slower tempo music with regular kick drums — like house or techno. Learning to beat mix with 180bpm jungle is courageous, but can be a frustrating experience.

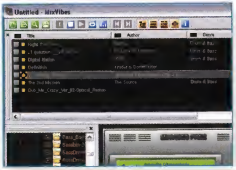
BASIC BEAT-MATCHING

3 With both decks playing and the cross-fader in the left position, get a feel for the song playing in deck 1. With this beat in mind, slide the fader over to deck 2 and compare the tempo. If it's faster, slide the speed control upwards to slow the track down (if the mode indicator says "tempo" or "pitch", click it until it says "speed" before changing the slider). Alternatively, you can use the +/- Pitch buttons beneath the green LCD-style display to finetune the speed.

Now, try bringing deck 1 back into the mix and compare the beats. It takes quite a bit of tweaking to get the two in sync, and this is where the arrow Search buttons become helpful. These can be clicked to jog the playback slightly forward and backward to realign the beats. If the tempos are even slightly out, they'll slip out of sync every few seconds. The Search buttons can bring them back into alignment as you adjust the speed.

Once the two tracks are beat-matched, you can get creative with cross-fading. While a slow cross-fade at the end of a track is a classic way of mixing, it isn't very interesting to perform or listen to. More sophisticated tricks involve cross-fading in time with the music and using the equaliser settings to change the frequency blend of the two pieces of music. For instance, it's possible to have

1 *MixVibes 5 Free provides two playback decks and a cross-fader, emulating CD DJ hardware.*



2 *The playlist pane at the top of the screen provides quick access to your music collection — just drag-and-drop tracks onto the decks.*

3 *The vertical speed sliders bring the tempos of each track into sync and the search buttons help align the beats.*

the cross-fader at centre position and highlight the bass line of one deck by cutting the bass frequency of the other. The same thing can be done to minimise or feature vocals with the mid-range and drum hits with the high-end. Performing these techniques with a mouse and keyboard is very cumbersome, which is why MixVibes Pro supports external hardware controllers — and automatic beat-matching too.

ADVANCED TECHNIQUES

Another thing about beat-matching is that your audience shouldn't hear you do it, which is why you need an audition function when DJing to a crowd. Although the free version of MixVibes is great for honing your skills, it doesn't have any preview features, making it useless for live mixing.

The Pro version allows you to use two sound cards — one for the mix and one for headphone auditioning. Alternatively, professional sound cards with multiple outputs can be used for the same purpose. To beat mix this way, one deck is sent to the main speaker output with the cross-fader, and the other is sent to the headphones with the monitor button on the deck. **4** Enabling the auto-bpm button in the toolbar results in white lines appearing in the waveform display of each deck (this option is also available from the Settings window under the File menu). These indicate the beat points and the tempo is displayed below in bpm. To automatically synchronise one deck to the other, click the A=B or B=A button below the cross-fade slider.

In addition to the three equalisation knobs found in the free version, MixVibes Pro includes kill switches for each, allowing you to drop out the specified frequency by clicking the button. This allows you to perform synchronised tricks such as dropping the bass line in and out. Even better is the EQ cross-fader located next to the standard cross-fader. By centring this slider and clicking the Cross EQ button, the three adjacent sliders can be manipulated to cross-fade the bass, mid-tone and treble frequencies of the two decks.

SAMPLE LOOPS

5 Another great trick borrowed from samplers is to extract a beat loop from one of the songs and play it indefinitely. This is great for extending peak sections of tracks as well as experimenting with tricks on the other deck, knowing all the while that your backing beat won't suddenly disappear. To use the loop sampler, which is located next to the playback controls in each deck, click the number of bars you want the loop length to be (½, 1, 2, 4, 8 or 16) followed by either the forward or reverse arrow button. To escape a loop once it's playing, click the Play button to continue.

VINYL TRICKS

6 For a classic vinyl effect such as the rewind used in drum 'n' bass tunes, click the Vinyl button on a deck and turn the jog shuttle control using the mouse. You can also click-and-drag in the waveform window. Not only does this recreate the sound of scratching records, but it can also be used to nudge the playback to retain sync. The slider beneath the jog shuttle will also do this, and both techniques are a vast improvement on the Search controls found in the free version.

For scratching, the vinyl effect settings need to be tweaked using the vinyl window (enabled via the turntable icon on the toolbar). The noise and crackle settings are simulation sound effects for damaged records, but the sensitivity and time controls relate to the scratching speed and the acceleration and deceleration of the turntable when starting and stopping playback.

MIXDOWN TO MP3 OR CD

When you're ready to record your mix, click the record button in the mixer window and enter a filename. The mix will be saved to WAV, which you can later convert to MP3 or burn to CD. Alternatively, capture the mix using the record button in the toolbar. This creates a VIB sequence file for later editing, which is a great way to tidy up mixes for export to WAV or MP3 (via the Mix menu). DJ

Other DJ applications

Traktor DJ for Mac and Windows is similar to MixVibes and has excellent automatic beat-matching. It also provides custom keyboard shortcuts for common DJ tricks like using kill frequencies and rapid cross-fades. For Linux, there's DJPlay, although it won't perform any beat-matching for you. For true DJ scratching with specialised hardware, Final Scratch is a commercial application for Mac OS X, Windows and Linux that allows you to use standard turntables to mix MP3 files.

Inside info

- MixVibes
www.mixvibes.com
- Traktor DJ
www.nativeinstruments.com
- Virtual DeeJay MKIII
www.freenetpages.co.uk/hp/all.reld/Index.htm
- DJPlay
http://djplay.sourceforge.net

4 *MixVibes 5 Pro provides a lot more features, including automatic beat-matching and mix recording.*

5 *The loop controls next to the cue button provide real time sampling of the current track for prolonging breakdowns while mixing in the other deck.*

6 *The vinyl controls can be used to emulate record noise and DJ scratch mixing techniques using the mouse.*

Just add water

The basic principles of water-cooling are simple, but the installation details vary for each system. *James Rolfe* takes you through the installation of a typical water-cooling kit.

Skill level
Beginner to intermediate

Requirements
Phillips head screwdriver • small pliers • cable ties.

Time to complete
1 to 4 hours (varies with kit complexity).

Inside info
- Water-cooling.com
www.water-cooling.com
- Overclockers Australia
www.overclockers.com.au
- Ultimate Water-cooling Guide
www.spodesabode.com/content/article/watercool

For many, water and computers sounds like a catastrophic combination. However, when used properly, these solutions have many advantages. First and foremost is cooling performance. Traditional heatsinks and fans struggle under the load of gaming when installed on today's high-end CPUs, not to mention the hot air from the video card.

Water-coolers transport heat away from a CPU to a larger, more efficient radiator, taking advantage of the ambient air outside the case. There's also a significant advantage in terms of PC noise — instead of a single 60mm or 80mm fan screaming away on top of the CPU, a radiator can accommodate a larger, slower and quieter fan.

Leaks are a major concern of water-cooling, but the risk isn't as great as you think. A small leak usually won't damage components — even if the system is powered at the time — as long as it's shut down and swiftly cleaned up. Most PC components run on low-voltage supplies, reducing the risk of shock, but make sure that no conductive fluid leaks into your power supply.

TESTING, TESTING

1 Checking your water-cooling system for leaks or problems before installing it into your PC is always recommended. Some kits (such as our demonstration model, the Global WIN Silent Stream) come with pre-connected hoses already filled with water. If yours doesn't, read the instructions on connecting the hoses and correctly filling the system with fluid. It's best to do this on a towel or in a sink. If your kit has an internal power connector, test it next to your running PC. Don't be too concerned with powering the fans at this point — just make sure that everything is watertight.

Once the pump is running, check for leaks in the water blocks, seals, pump, radiator, reservoir and on all hose connections. Check that fluid is actually flowing by gently squeezing each part of the hosing and monitoring the flow indicator (assuming the kit has one).

Air bubbles in the lines can reduce the efficiency of the kit. Elevate the reservoir or drain pipe so it's above all other parts in your system and gently tap all of the components to dislodge any bubbles.

GETTING YOUR HANDS WET

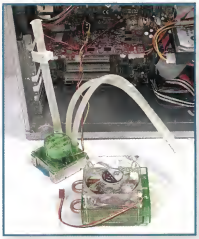
Once you're satisfied that the system is working without leaks and bubbles, it's time to install it.

2 First, unplug the PC from all mains power and remove the existing CPU cooler. If the radiator in your kit replaces a case fan, remove that fan too. In the demo unit, an 80mm exhaust fan near the CPU was removed.

3 The water block is the main component of any kit. This presses against the CPU core and is responsible for drawing heat away from your CPU and into the fluid. Most blocks can be attached to a variety of CPU sockets.

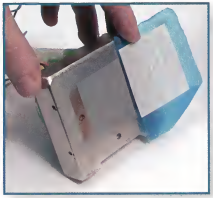
In common with conventional heatsinks, each manufacturer has its own idea about the best way to attach a block to the CPU socket. Connecting the block to Socket 370 and Socket A systems uses the socket lugs, or the four holes through the motherboard around the socket, for retention.

With Socket 478, the plastic frame used for mounting the stock heatsinks is often used, but



1 *Test any water-cooling kit outside your PC first to detect any leaks.*

2 *The noisy heatsink fan needs to be removed before the water block is affixed.*



3 *The underside of a water block is identical to most heatsinks, down to the copper core and thermal pad.*

occasionally this frame has to be removed and the mounting holes are used for the water-cooling system. If you have a newer CPU such as an Athlon 64 or LGA775 Pentium 4, make sure the kit can be affixed to your motherboard.

4 Correct clamping pressure between the water block and CPU core is vital. Too little pressure and thermal transfer will be inefficient — the CPU will run hot while the fluid stays cool. On the other hand, too much pressure can damage the CPU core or motherboard. Most kits include some kind of sprung mechanism to ensure the correct clamping pressure. The Silent Stream mounts on an AMD Socket A CPU with a simple metal clip. A screw knob on the top applies the correct amount of pressure when it's fully tightened.

APPLYING PRESSURE

As with an air-cooled heatsink, using a thermal pad or paste is a good idea. This smoothes out any minute surface irregularities and prevents air bubbles from interfering with thermal transfers from the CPU core to the water block.

Thermal pads are single use and need to be replaced with thermal paste if the block is used elsewhere. When applying thermal paste, only a very thin, translucent layer is required on the top of the CPU core. Too much paste is not only messy, it makes the system less efficient.

Some kits include additional water blocks for the motherboard Northbridge or the GPU on the video card. These blocks occasionally use existing retention clips of plugs, much like the CPU block. If you have no way of fixing the block to the chip, use a small amount of thermal adhesive. Using a kit with these extra water blocks allows you to build a whisper-quiet PC.

5 At the other end of the cooling system is the radiator. This transfers heat from the fluid to the surrounding air. A fan is usually used to force air through the radiator, but if you're after a silent solution, fanless radiators are available. In many instances, the radiator is designed for use in a standard case fan-mounting location.

For extra performance, mount the radiator outside the case and make sure that the fan draws air from the exterior, through the radiator, and into the case. This boosts the performance of the radiator and the entire cooling system. Long screws go through the normal 80mm fan mounting holes in the case and are secured with small nuts.

If your kit contains an isolated pump, mount that next. In some kits, the pump is located inside the water block. In others, the pump may be in the reservoir or housed separately.

HOLD YOUR BREATH

6 After installation is complete, test the system in the same way you did before the installation. Once any or all bubbles have been removed from the pipes, keep monitoring your system for at least the next hour in order to make sure there are no leaks and that the CPU and other components remain cool. During this time, run a game, application or benchmark that makes heavy demands on the CPU to run in the new cooling rig.

As soon as you're completely satisfied that everything is working properly, use cable ties to tidy up the hoses — this keeps them from moving around in the case where they could become crimped. Don't tie them too tightly or you'll restrict the coolant flow.

Keep an eye on the fluid levels — most kits are prone to evaporation and require top-ups every few months. A lot of systems use distilled water, but check the manual as it may have other specific fluid requirements.

Finally, moving a PC with a water-cooling system can be problematic. Draining it before you take it to a LAN party is a good idea. Moving the PC can also introduce air into the pipes, so if draining the kit is inconvenient, flush the system before getting into the gaming action. UTP

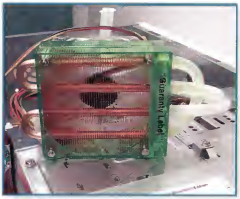
Galvanic corrosion and green slime

One of the big concerns for DIY water-coolers is galvanic corrosion. It occurs when a cooling fluid acts as an electrical conductor between two different metals, causing one to corrode rapidly. Early Senfu water-cooling kits were infamous for this. Their aluminium water blocks and copper radiators formed a primitive battery which, over the course of a few months, badly corroded the water block internals.

Also, algae can thrive in the nice warm water. Over time, it can form slimy colonies which reduce the efficiency of your system or stop it working entirely.

Manufacturers have been well aware of these issues for some time, so any modern water-cooling systems ought to be specifically designed to prevent either from occurring. The crucial component is the fluid itself. Most kits come with a special, non-electrically conductive, algae-inhibiting liquid — usually distilled water with an additive.

4 *Too little clamping pressure reduces cooling efficiency, but too much can damage your CPU.*



5 *The radiator works just like those found in cars — air passing through the fins cools the water.*

6 *The final result. Cable ties can be used to manage your pipes, but don't fasten them too tightly.*

Making connections

***Anthony Caruana* guides you through the process of getting your Pocket PC wirelessly connected to the Web.**

On the cover CD

Bonus CD software

vxUtil Personal 1.6.1
- **vxIPConfig 0.9.5**
- **pocketWinc 2.0**
- **MiniStumbler 0.4.0.**

Skill level

Intermediate

Requirements

PDA with Windows Mobile 2003 Software for Pocket PC or Windows Pocket PC • integrated Wi-Fi or an external adaptor • wireless access point or router, connected to the Internet.

Time to complete

1 hour (approx)

PDAs are capable of so much more than just storing contact and calendar details. They can provide the essentials of computing anywhere, anytime. With a little patience and Windows Mobile 2003 Software for Pocket PC or Windows Pocket PC, you can surf the Web and send and retrieve email from almost anywhere.

Start by preparing your wireless router or access point before attempting to connect the PDA. Make sure the router can establish an Internet connection and test it with a cabled device. This ensures that if you do have any problems, you'll know they aren't due to a breakdown in communication. If WEP is enabled, keep a note of the key. Also, write down your SSID and the channel the router is transmitting on. It's a good idea to enable SSID broadcasting when adding a new wireless device to a WLAN; you can disable it once setup is complete.

Enable the Pocket PC's Wi-Fi adaptor or, if your device doesn't have integrated wireless networking, insert a wireless network card. After a few seconds, the PDA should detect a wireless network and prompt for connection either to The Internet or Work. Select Work since the PDA doesn't have a direct connection to the Internet; it will be connecting through a router.

Windows Mobile makes it easy to find wireless LANs but isn't intuitive in connecting to them. Test the Web connection by starting Internet Explorer and browsing to a site. If that doesn't work, check the device's network settings. Navigate through Start > Settings > Connections, open the Connections applet and choose Advanced > Select Networks. Make sure you have My Work Network set for automatic Internet connection.

TROUBLESHOOTING TOOLS

Your network card may have its own tool for telling you the device's IP address and carrying out basic commands like `ping` to test network connectivity. If not, vxUtil Personal (**www.cam.com/vxutil_pers.html**) and vxIPConfig (**www.cam.com/vxipconfig.html**) can be invaluable aids — both programs are included on this month's cover CD.

VxIPConfig provides a basic troubleshooting kit, giving the IP address, subnet mask, default gateway and DHCP server. If your device hasn't been allocated a valid address, release the current address and get a new one using its renew function. VxUtil comes complete with port scanner, ping tool and the ability to do a ping sweep, looking for devices within an IP address range.

KEEP IT SAFE

The Pocket PC's network authentication settings need to be amended if WEP is enabled. Go to Start > Settings > Connections > Advanced > Network Card and select your wireless connection. Next, open the Network Key section, choose the same Authentication Type as your router and enter the key.

Enable security features such as ICMP blocking, disabling SSID broadcast or MAC address filtering one at a time, resetting both the router and Pocket PC as you turn each on. That way, you know which change to reverse if connectivity is broken.

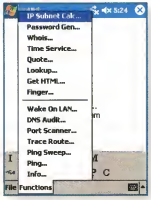
Once connected, you can surf the Internet from your Pocket PC and use Activesync to synchronise your PIM data via your LAN. ETTP

On the road

If you want to access the Internet with your PDA while you're on the road, you can connect via publicly accessible wireless hotspots. While there are a few free ones around, you generally need to register to gain access. The main trap for users is that registration may not support Pocket Internet Explorer, as it doesn't comply with all the latest authentication standards.

MiniStumbler (*http://stumbler.net*) is a free tool that scans for available WLANs. PocketWinc (*www.cirond.com*) delivers a WLAN sniffer but includes ping, trace route and automatic testing of an Internet connection. It can also record signal strength in a CSV file, making it handy for finding transmission blind spots.

***Network lowdown:** getting on address is the first step in troubleshooting a network connection.*



***Utility belt:** vxUtil provides a comprehensive set of tools for troubleshooting connections.*

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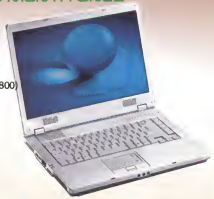

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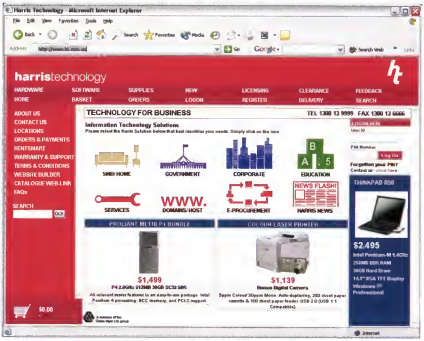

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TECRA M2

The Tecra M2 series is the ideal mobile computing platform for business. Boasting high level business performance features, extended freedom to roam wherever you are required to work and versatile expansion providing room to grow. These features combine in a robust magnesium alloy chassis to protect your investment and extend product life. The Tecra M2 is easy to deploy and manage through a scalable technology platform with long life cycles reducing the cost of ownership. **Tecra M2s weigh from 2.26kg and include modem and LAN capabilities.**

MODEL	TECRA M2	TECRA M2	TECRA M2	TECRA M
MOBILE PENTIUM M	1.5GHz	1.6GHz	1.7GHz	735 - 1.7G
RAM STD	512MB	512MB	512MB	512M
HARD DRIVE	40GB	60GB	80GB	80G
SCREEN	14.1" XGA TFT	14.1" XGA TFT	14.1" XGA TFT	14.1" XGA TF
VIDEO RAM	64MB	64MB	64MB	64M
OPTICAL DRIVE	DVD/CD-RW	DVD Super Multi	DVD Super Multi	DVD Super Mu
WIRELESS LAN	Antenna	WiFi b/g	WiFi b/g	WiFi g & E
WARRANTY	1 year	1 year	1 year	1 ye
OP SYSTEM	XP Pro	XP Pro	XP Pro	XP P
RENT*	$28.07/wk	$31.75/wk	$34.93/wk	$37.96/
PART NUMBER	N6274	N6275	N6276	N627
PRICE	$2,795	$3,095	$3,520	$3,85

TECRA S1

The Toshiba Tecra S1 delivers outstanding performance and seamless wireless connectivity to business computing. Now free to perform at their best wherever business takes them, executives will appreciate the added mobile productivity of the Tecra S1 with up to 4.5 hours of battery life. Easy to deploy and manage, the Tecra S1 is ideal for business customers wanting to reduce total costs of ownership and increase product lifecycle. Perfect for special applications and multi-tasking, the award winning Tecra S1 series rivals many desktops in power and scalability. **All Tecras include modem and LAN capabilities.**

MODEL	TECRA S1	TECRA S1	TECRA
MOBILE PENTIUM M	1.5GHz	725 - 1.6GHz	1.7G
RAM STD	512MB	512MB	512M
HARD DRIVE	40GB	60GB (7200rpm)	80
SCREEN	15" TFT XGA	15" TFT SXGA+	15" TFT UXG
VIDEO RAM	32MB	32MB	32
OPTICAL DRIVE	DVD/CD-RW	DVD Super Multi	DVD Super Mu
WIRELESS LAN	WiFi b/g	WiFi b/g & BT	WiFi b
WARRANTY	1 year	1 year	1 ye
OP SYSTEM	XP Pro	XP Pro	XP P
RENT*	$30.46/wk	$36.67/wk	$41.75
PART NUMBER	N6408	P6963	N64
PRICE	$2,970	$3,695	$4,23

TOSHIBA

ECRA A2 & PORTÉGÉ SERIES & PROJECTORS

ECRA A2

SHIBA'S NEW TECRA A2 NOTEBOOK FOR SMB.

eaturing the latest Mobile Intel® Pentium® M or Intel® Celeron® M processor and h a standard battery life of up to 4.2 hours, all four models in the series deliver h levels of performance and reliability. Also helping to maximise productivity is full range of expansion and connectivity features including a PC Card slot, four B 2.0 ports, an international V.90 modem and a 10/100 Mbit Ethernet LAN port.

ptional Port Replicator for the A2 Tecra notebook range

ECRA	A2 SERIES	A2 SERIES	A2 SERIES	A2 SERIES
ROCESSOR	Cel-M 320 1.3GHz	Cel-M 330 1.4GHz	P-M 1.5GHz	P-M 1.6GHz
AM STD	256MB	256MB	512MB	512MB
ARD DRIVE	40GB	40GB	40GB	60GB
CREEN	14" XGA TFT	14" XGA TFT	15" XGA TFT	15" XGA TFT
PTICAL DRIVE	DVD/CD-RW	DVD-RW	DVD-RW	DVD-SuperMulti
6K V.90 & 10/100 LAN	Yes	Yes	Yes	Yes
IRELESS LAN	No	802.11b/g	802.11b/g	802.11b/g
ARRANTY	1 year	1 year	1 year	1 year
P SYSTEM	XP Pro	XP Pro	XP Pro	XP Pro
ENT*	$17.87/wk	$21.57/wk	$24.4[illegible]/wk	$2[illegible].24/wk
ART NUMBER	N9614	N9616	N9618	N9619
RICE	$1,595	$1,925	$2,365	$2,860

DRTÉGÉ SERIES

*These three models have Intel® Centrino technology

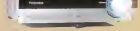
ORTÉGÉ	R100*	M200 TABLET *	M100*
OBILE PENTIUM M	1.1GHz	1.6GHz	1.3GHz
AM STD	512MB	512MB	512MB
ARD DRIVE	40GB	80GB	80GB
REEN	12.1" XGA	12.1" SXGA+	12.1" XGA
K V.90 & 10/100 LAN	Yes	Yes	Yes
RELESS LAN	WiFi b/g	WiFi b/g	WiFi g & BT
PTICAL DRIVE	No	No	DVD/CD-RW
EIGHT	From 1.1kg	2.1kg	From 1.8kg
P SYSTEM	XP Pro	XP Tablet	XP Pro
NT*	$39.39/wk	$44.[illegible]2/wk	$41.21/wk
ART NUMBER	P3052	P2478	N9189
RICE	$3,995	$4,495	$4,180

SATELLITE P20

- Intel Pentium 4 with HT 3GHz
- 512MB DDR RAM (2GB Maximum)
- 80GB Hard Disk
- 17" Wide XGA TFT (1440 x 900) display
- DVD SuperMulti Drive
- 56k V.90 modem
- Wireless a/b/g
- Microsoft® Windows® XP Professional
- 1 year courier pickup & return parts and labour warranty

N7158 Rent* $43.33/wk **$4,395**

DLP PROJECTORS



S20 image

- Excellent brightness
- Quiet operation
- 2 year warranty with 3 Month Hot swap

MODEL	S20	T90
ANSI	1400	2000
WEIGHT	3.0Kg	2.8Kg
RES	SVGA	XGA
RENT*	$[illegible].8+/wk	$[illegible]/wk
PART	P0226	P0228
PRICE	$1,949	$3,989

***RENTSMART**
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COMMUNICATION

3 MOBILE BROADBAND

WHAT YOU PAY FOR YOUR CARD $0 NETCONNECT CARD

$0^ on a $49 per month plan with $49 of included Mobile Broadband.

^When you connect for 24 months. Total minimum cost over 24 months is $1,176. If service is disconnected within 24 months $25 a month for remaining months of contract term is payable. Included Mobile Broadband does not include usage while roaming on GPRS in 3's Video & Messaging Zones. Unused included Mobile Broadband usage expires each month. Hot for 3 plan applies to use of a NetConnect Card USIM in a 3 mobile. Your service may be disconnected if your USIM is used with other devices.

FAST EMAIL ON THE ROAD

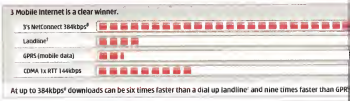
- The NetConnect Card gives you mobile broadband connection in 3's Video Zones.
- Wireless access to email, Internet and corporate databases when in 3's Video and Messaging Zones.
- Send SMS messages from your notebook to multiple recipients.

$99 MOBILE BROADBAND CAP

The $99 Mobile Broadband Cap gives you up to $500 worth of Mobile Broadband usage for $99 per month, and includes a low rate of 0.1c/KB for Mobile Broadband use in 3's Video Zones.*

INCLUDED IN THE PACK

- **1 x NetConnect Card,**
- **1 x CD (Modem Manager Software with User Guide),**
- **1 x Protective Leather Wallet**



*Standard charges payable after $500. Mobile Internet usage while roaming on GPRS in 3's Video & Messaging Zones will be charged at 0.4¢/KB and is not included in the Cap or within included usage. #Download speeds of up to 384kbps are attainable in 3's Video Zones and download speeds of up to 40kbps are attainable in 3's Messaging Zones. The speed of the NetConnect Card will vary according to the zone you are in. Actual user speed may vary depending on a number of factors including location, network usage, equipment and applications used and worldwide Internet performance. †Comparison with 56kbps dial up modem.

3 MOBILE SOLUTIONS CAN ONLY BE PURCHASED VIA PHONE OR WEB FOR DELIVERY ONL

CALL NOW FOR LATEST PLANS AND PRICING **CALL 1300 13 999**

02 XDA II HEADSET BUNDLE

ClicOn BRACKET

for XDA II, Tilt Swivel Base, Powered Plug in Car Charger

P6066 **$125**

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O2 XDA II POCKET PC & GSM PHONE WITH BLUETOOTH HEADSET

Experience the convenience of being connected wherever you go. You may be in your car, your client's office, at the airport and still access the internet, your e-mails and even your corporate applications. You may also exchange files, contacts pictures and videos with another device or computer. The one device that does it all - the O2 XDA II.

- Processor: Intel PXA263 400MHz
- Main Memory: 128MB RAM
- System Memory: 64MB ROM
- Display: 3.5" TFT touch screen
- Audio: Built In w/ Hands Free Support
- Camera: Built In (640 x 480)
- Input Device: 5 Way Navigation Button, 4 Programmable Buttons, 2 GSM, Stylus
- Expansion/Communication: Integrated SD/MMCard Slot
- Synchronisation: Infrared, USB cradle with cable, Bluetooth
- Tri-band GSM / GPRS Mobile Communication
- Dimensions: 1219 x 762 x 10.2mm
- Weight: 190g
- Microsoft Mobile Windows 2003 for Pocket PC
- Software: MMS, Wireless modem using USB, serial and IR, Photo caller ID, PPT viewer, PDF viewer, Camera capture utility, VGA output utility, SDIOnow, XBackup, 32 chords Polyphonic MIDI ringtone, Games

Bluetooth

XPhone Bluetooth Clip Heads

P7189 Rent* $14.56/wk **$1,29**

ONY MICROVAULT & VAIO NOTEBOOKS

NEW VAIO K SERIES

The K Series boasts an all new design which really stands out from the crowd. It's all silver body gives it a stylish appearance while its wedge shape gives it that added uniqueness for which VAIO is famous. Check out the K74 and K76P now and see what all the fuss is about.

CGK74

- ntium 4 2.8GHz
- 7" XGA LCD
- 56MB RAM
- GB HDD
- DVD/CD-RW Combo Drive
- XP Home
- Memory Stick Slot

P2863 Rent* $22.40/wk **$1,799**

PCGK76P

- Pentium 4 3.06GHz
- 15" XGA Clear Bright LCD
- 512MB RAM
- 60GB HDD
- DVD±RW Drive
- XP Professional
- 64MB Video RAM
- Wireless 802.11g

P2862 Rent* $34.72/wk **$3,199**

AIO PORTABLE NOTEBOOKS

WIDE SCREEN LCD

GNS18GP

VAIO S18, combining a widescreen LCD and a sleek ltweight chassis, is able to surpass the boundaries ween personal and business requirements. With a w slim black and metallic silver design and weighing 1.89kg, the brushed magnesium case opens to eal an exceptional 13.3" WXGA screen.

- ntium M 1.6GHz
- .3" Wide WXGA Display
- 2MB RAM
- VD-RW Drive
- 60GB HDD
- 32MB Video RAM
- Wireless 802.11g
- XP Professional

0024 Rent* $42.38/wk **$4,299**

ULTRA PORTABLE

PCGTR5GP

This complete notebook pc has everything you could ask for. It's small, lightweight, powerful, wireless ready and comes with all the connectivity options you will ever need. Complete with Windows XP Professional this little notebook is set to become the newest and inseperable part of your life!

- Pentium M 1.1GHz ULV
- 10.6" Clear bright WXGA LCD
- 768MB RAM
- DVD/CD-RW Combo Drive
- 40GB HDD
- Built-in Camera
- Wireless 802.11g
- XP Professional

P0023 Rent* $42.38/wk **$3,999**

AIO A SERIES

GNA15GP

- entium M 1.5GHz
- 5" XGA Display
- 2MB RAM
- VD/CD-RW Combo Drive
- 40GB HDD
- 64MB Video RAM
- Wireless 802.11g
- XP Professional

3934 Rent* $30.76/wk **$2,999**

WIDE SCREEN

VGNA19GP

- Pentium M 1.6GHz
- 15.4" WXGA LCD (1280 x 800) with Clear Bright and Dual Lamp
- 512MB RAM
- DVD±RW Drive
- 60GB HDD
- 64MB Video RAM
- Wireless 802.11g
- XP Professional

P6098 Rent* $40.67/wk **$4,299**

MICROVAULT

USB 2.0 PORTABLE STORAGE DEVICE.

Software Bundle enables you to:

ELITE SERIES

N1310	128MB	$95
N1311	256MB	$155
N1312	512MB	$289

MINI SERIES

N1313	64MB	$69
N1314	128MB	$105
N1315	256MB	$165

BIOMETRIC

Biometric Micro Vault 128MB with FInger Print Security Recognition

N2862	128MB	$182

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acer

NOTEBOOKS

ACER ACCESSORIES

TRAVELSURE CARRY CASE

P0448 **$49**

USB OPTICAL MOUSE
Silver USB mini optical with scroll wheel

L1831 **$35**

EXTERNAL USB 1.44MB FLOPPY DISK DRIVE

L1793 **$179**

ADDITIONAL BATTERY
for 240, 250 and 2500 series

L1811 **$299**

AC ADAPTOR + POWER CORD
for 2000 and 2500 Series

P3285 **$137**

TARGUS USB 2.0 MOBILE PORT STATION

N0426 **$249**

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TRAVELMATE 2502LM

NEW

The TravelMate 2500 Series combines practicality with first-class performance for small/home offices, small-to-medium businesses and government/educational institutions.

- Intel Pentium 4 3GHz (with Hyper-Threading)
- 256MB RAM
- 40GB Hard Disk Drive
- DVD±RW Drive
- 15" XGA TFT up to 64MB Shared Video Memory
- Built-in 56Kbps fax/modem + 10/100 Ethernet
- Lithium-Ion battery up to 2 hours life
- Fast Infra-red port
- 1 x Parallel Port
- 4 x USB 2.0 ports
- 2 x Type II PCMCIA
- Weighs 3.4kg
- **Windows XP Professional**

Microsoft Windows xp Professional

Intel inside pentium 4

Rent* $24.81/W

P3176 **$2,39**

ASPIRE 1681WLMI

NEW

The Aspire 1681 series entertainment notebook from Acer is a stylish, powerful, and reliable portable solution that is certain to impress. The brilliant 15.4" widescreen LCD is ideal for playing DVDs and for demanding business applications. With Intel Centrino mobile technology, a long-life battery, built-in Bluetooth and wireless LAN you can work all day in any location.

- Intel Centrino Pentium-M 715 (1.5GHz)
- 256MB RAM
- 60GB Hard Disk Drive
- DVD±RW Drive
- 15.4" Active colour WXGA screen
- 3-in-1 card reader
- Built in modem, Ethernet, WiFi g & bluetooth
- Fast Infra-red, FireWire, S-Video ports & 3 USB 2.0 Ports
- ATI MobilityRadeon 9700 accelerator with 64MB DDR RAM

Microsoft Windows xp Professional

intel inside centrino MOBILE TECHNOLOGY

- Weighs 2.9kgs
- Lithium Ion battery up to 5 hours life
- **Windows XP Professional**

Rent* $28.71/

P3177 **$2,79**

ACER'S 2 HOUR COMMITMENT WARRANTY EXPRESS SERVICE GUARANTEES THAT YOU'LL NEVER BE KEPT WAITING AGAIN

1 year return to base with 2 hour Express Service. 2 hour repair turnaround available in Brisbane, Sydney, Melbourne, Perth, Canberra, Adelaide, Hobart, Auckland, Christchurch & Wellington.

ESKTOP PC & SERVER

CER POWER F1 SERIES

al for small business PC users, AcerPower F1 series is a high formance desktop PC at an rdable price. Available with the ion of Hyper-Threading technology d up to 1MB L2 cache, the AcerPower features upgradeable graphics, grated LAN and audio. The micro-er housing design provides total actural integrity, durability and erational peace of mind integrated hin an attractive and highly usable sing.

celeron™ PROCESSOR

pentium 4

NEW

ODEL	POWER F1	POWER F1	POWER F1	POWER F1
ROCESSOR	Cel 2.8GHz	Cel 2.8GHz	P4 2.8GHz	P4 3.0 GHz
EMORY	256MB	256MB	256MB	256MB
ARD DRIVE	40GB	40GB	40GB	80GB
PTICAL DRIVE	CD-ROM	DVD/CDRW Combo	DVD/CDRW Combo	DVD/CDRW Combo
/100 ETHERNET	YES	YES	YES	YES
ODEM 56k V.90	NO	YES	NO	YES
ARRANTY	1yr on-site	1yr on-site	1yr on-site	1yr on-site
P SYSTEM	XP Pro	XP Pro	XP Pro	XP Pro
ENT*	$10.07/wk	$11.19/wk	$12.87/wk	$14.56/wk
ART NUMBER	P3103	P3108	P3109	P5923
RICE	$899	$999	$1,149	$1,299

LTOS G310 - PERFORMANCE WORKGROUP SERVER

lel Pentium 4 2.8GHz processor (533MHz FSB)
6MB RAM
MB VGA Graphics Card
GB S-ATA HDD (7200RPM)
ROM
k USB ports
0W power supply
er Easy Build Software Suite
years parts and labour Warranty

pentium 4

OS G310

Rent* $12.31/wk

478 **$1,099**

ACER POWER F1 SERIES

Three good reasons to choose the AcerPower F1:

Fact: Uncomplicated and to the point, designed for users who value a straightforward computer delivering the latest processing power and the ability to handle complex business tasks efficiently.

Fact: The latest in proven technology combined with Acer's high-level reliability gives users a dependable and cost-effective configuration that both simplifies management and lifts office productivity.

Fact: Offers multiple means to upgrade and expand functionality, ensuring businesses make the most of their investment.

SPECIFICATIONS:

- Intel Pentium 4 3.0GHz (800MHz FSB)
- 512MB RAM
- 80GB (7200RPM)
- 56K Internal Modem
- DVD SuperMulti drive (Burns DVD's)
- Microsoft Windows XP Professional
- 1 year on-site Warranty

Rent* $16.80/wk

P5937 **$1,499**

***RENTSMART**
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invent

HP DESKTOP, SERVER & POCKET PC SOLUTIONS

HP PROLIANT ML110 SERVER SBS BUNDLE

- Intel Pentium 4 2.8GHz with HyperThreading Technology, Integrated 1024KB L2 cache
- 512MB PC3200 DDR SDRAM
- Broadcom 5705 PCI Gigabit NIC (embedded) 10/100/1000 WOL (Wake on LAN)
- 36.4GB Ultra320 SCSI 10K
- Internal Storage 288GB maximum
- 48x IDE (ATAPI) CD-ROM Drive
- Protected by HP Services, including a one-year, limited warranty,
- **Microsoft Windows Small Business Server 2003 + 5 CALs standard (pre-installed)**

P2686 Rent* $16.80/wk **$1,499**

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HP COMPAQ DX2000 MICROTOWER

NEW

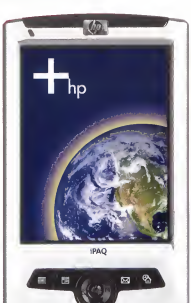
- Intel Pentium 4 3.0GHz processor with 800MHz bus with Hyper-Threading
- 1MB L2 Advanced Transfer Cache
- 256MB DDR SDRAM PC2700 (333-MHz) Non-ECC
- 40GB 7200rpm SMART III Ultra ATA/100 Hard Drive
- CD-RW
- 3 full-height PCI slots
- Five bays: 2 external 5.25" bays, 1 external 3.50" bay & 2 internal 3.50" bays
- 2 front USB 2.0 ports, 6 rear USB 2.0 ports
- **Microsoft® Windows® XP Professional**

P7052 Rent* $12.87/wk **$1,14**

HP IPAQ RX1710 POCKET PC

THE SLIM AND SLEEK HP IPAQ RZ1710 SERIES POCKET PC MAKES IT EASY TO BE PRODUCTIVE AT WORK, AT HOME, OR ON THE GO.

- Processor: Samsung S3C2410 203MHz
- Main Memory: 25MB RAM (including 10MB iPAQ File Store)
- Display: 3.5" TFT touch screen 240 x 320
- Audio: Microphone, speaker, 1 x 3.5 mm headphone jack, MP3 stereo through audio jack
- Input Device: Stylus, 5 way navigation button and 4 application buttons
- Expansion: SD/MMCard Slot with SDIO
- Communication: Infrared, USB sync cable
- Microsoft Windows Mobile 2003
- Software: HP Image Zone, HP Task Switch, HP Profiles, HP Utilities



NEW

Image for Illustration purposes only.

P5971 **$49**

OR BUSINESSES ON THE MOVE

almOne TUNGSTEN T3

U'VE NEVER HAD IT THIS GOOD.

TUNGSTEN | T3

ndle spreadsheets, wireless plications and multimedia tasks h blazing speed and boundless formance with the Tungsten™ T3 ndheld's ultra-fast 400MHz Intel® cale processor, Palm OS® 5.2.1 d 64MB of memory.

Processor: Intel XScale 400MHz
Main Memory: 64MB RAM (52MB user accessible)
Display: TFT Colour 320 x 480 Stretch Display
Audio: Built-in
Expansion/Communication: Integrated SD/MMCard Slot (SDIO)
Synchronisation: Bluetooth, Infrared, USB cradle with cable

Windows compatible only
cluded on CD-ROM

- Dimensions: 109 x 76 x 13mm (closed)
- Weight: 156g
- Battery: 900 mAh Lithium-Ion
- Palm OS 5.2.1
- Software: Palm Desktop 4.1, Calendar, Contacts, Memos, Tasks, NotePad, Voice Memo, Expense[1], VersaMail v2.6, PhoneLink[2], Dialer[2], Documents To Go v6.0[2], Palm Photos[2], RealOne Mobile Player[2], Kinoma Video Player[2], World Clock[2], Telephony/SMS[2]

Bluetooth

:701 Rent* $7.27/wk **$649**

almOne TUNGSTEN E ARDCASE BUNDLE

E SLEEK AND POWERFUL palmOne TUNGSTEN E HANDHELD MES PACKED FOR BUSINESS AND PRICED FOR VALUE.

TUNGSTEN | E

ess your calendar, contacts important information
where. Create and edit Word, el and PowerPoint[3] compatible on the run. Synchronise with ook's[3] calendar, contacts, s, notes and email right out e box. Stay productive using ted features to palmOne's rd winning organisation ware. Listen to MP3s[4], watch o clips[5] and view photos rever you go.
werpoint & Outlook windows mpatible only
quires Expansion card sold erately
icktime required

- Processor: TI 126MHz OMAP311 ARM Processor
- Main Memory: 32MB RAM (28.3MB use accessible)
- Display: 4.5" TFT colour display 320x320
- Audio: Built In
- Expansion/Communication: Integrated SDIO/MMCard Slot
- Synchronisation: Infrared, USB HotSync Cable
- Dimensions: 115 x 78 x 12mm
- Weight: 131g

:239 **$395**

^CASH IN ON THIS

$70 cashback on a palmOne Tungsten T3 handheld. Yours if you buy between 01/09/04 and 30/09/04. Simply send in a completed redemption form with proof of purchase. Terms and conditions apply, see website for a copy of the redemption form and more details **www.palmone.com/au/products/promotions/cashback/**

Not available with any other offer. Redeemable through palmOne only.

palmOne ACCESSORIES

palmOne MINI USB CRADLE FOR T3
M8144 **$73**

palmOne TRAVEL CHARGER FOR T3
C5065 **$99**

palmOne RETRO SLIP CASE
P0134 **$29**

palmOne HARD CASE FOR T3
L4785 **$59**

palmOne UNIVERSAL ESSENTIAL KIT
L4794 **$39**

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D-Link

Building Networks for People

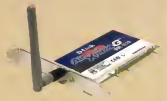
NETWORKING SOLUTIONS

11/54/108 Mbps WIRELESS LAN PCMCIA CARD
DWL-G650

This adapter supports high-speed wireless networking of up to 108Mbps, while providing seamless interoperability with all existing 802.11b and 802.11g wireless equipment. Together with better security, this adapter is the ideal wireless solution that offers an upgrade to a fast, new technology while protecting your past investments through interoperability with your current network equipment.

L6046 **$89**

11/54/108 Mbps WIRELESS LAN PCI ADAPTER
DWL-G520



This adapter supports high-speed wireless networking of up to 108Mbps, while providing seamless interoperability with all existing 802.11b and 802.11g wireless equipment. Together with better security, this adapter is the ideal wireless solution that offers an upgrade to a fast, new technology while protecting your past investments through interoperability with your current network equipment.

L6045 **$99**

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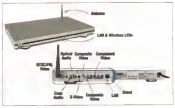
NEW

WIRELESS MEDIA PLAYER
DSM-320



- Play music, videos and display photos
- Stream media content from your PC to your Entertainment center
- Listen to digital music on your stereo system
- View digital photos, slideshows and video on TV
- Remote controlled TV interface for quick access to yo media content
- Supports all popular digital media formats
- Connects wirelessly using 802.11g or via ethernet
- UPnP AV and INMPR compliant

P0414 **$389**

11/54/108 Mbps WIRELESS LAN ACCESS POINT WITH SIMULTANEOUS BRIDGING DWL-2100AP

- 11 / 54 / 108Mbps wireless LAN access point/bridge
- 10/100Mbps fast ethernet interface for connecting to wired network
- IEEE 802.11g standard & downward compatible with IEEE 802.11b
- WDS (Wireless Distribution System)
- Autosenses & adjusts speed to conditions for maxim performance
- 64-/128-/152-Bit Wired Equivalent Privacy (WEP) security support
- WiFi protected access (WPA)
- Support for IEEE 802.1x Security
- SNMP Management
- DHCP Server / Client
- Configuration & management via web browser
- Replaceable antenna with reversed SMA connector for extending wireless range

N6053 **$199**

11/54/108 Mbps WIRELESS ROUTER
DI-624

Connects up to 20 computers without wires and up to 4 computers with wires to share the Internet, swap files and share a printer on a wireless network.

- Advanced firewall & parental control
- Easy installation
- 802.11g, 802.11b compatible
- Increased security with 802.1x and WPA

J4539 **$215**

11/22/54 Mbps WIRELESS IP ROUTER + 4 PORT SWITCH
DI-724P+

D-Link AirPlus ExtremeG+TM 11 / 54Mbps Wireless I Router for DSL/Cable Modems with 4 port Switch & P Server.

- WiFi Protected Access (WPA)
- 4 port 10/100Mbps switch
- 10/100Mbps WAN Port for DSL / Cable Modem
- Support NAT for single IP Address & Firewall Protection

M2928 **$235**

D-Link

Building Networks for People

ETWORKING SOLUTIONS

ON-SITE MAINTENANCE OW INCLUDED

D-LINK NOW OFFERS "AT NO EXTRA COST" ON-SITE MAINTENANCE & "LIFETIME" WARRANTY ON ALL MANAGED SWITCHES.

D-Link now offers "AT NO EXTRA COST" on-site maintenance providing 10 hours - 5 days - 8 hour response time, onsite service with product replacement, 8:00am to 6:00pm Monday to Friday (excluding public holidays) all D-Link Managed Switches listed below;
DGS-1216T, DGS-1224T, DES-1226G, DES-3226S, DES-3526, DES3550, DES-3326SR,DES-3250TG, DES-3350SR, DGS-3224TGR, DGS-3324SR, DGS-3324SRi, DES-6000, DES-6300

-LINK 16-PORT 10/100/1000Mbps

PPER GIGABIT WEBSMART SWITCH WITH PORT COMBO MINI GBIC
S-1216T

16 PORT

ebSmart gigabit ethernet switch
x 10/100/1000Mbps auto-negotiating ports
x Combo Mini GBIC Ports
uto-negotiation of MDI-II / MDI-X cross over for sy expansion
ort trunks (aggregation) for server / network ckbone connections
ort-based VLAN support to enhance security / twork performance
2.1p priority queues, port-based QoS
EE 802.3x flow control
onfiguration through web-based management
" rackmount installation
cludes NetProtect standard (10x5x8) - 1 Year nsite maintenance (Australia only)

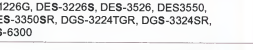
Rent* $10.63/wk

1045 **$949**

D-LINK 24-PORT 10/100/1000Mbps

COPPER GIGABIT WEBSMART SWITCH WITH 2-PORT COMBO MINI GBIC
DGS-1224T

24 PORT



- WebSmart gigabit ethernet switch
- 24 x 10/100/1000Mbps auto-negotiating ports
- 2 x Combo mini GBIC ports
- Auto-negotiation of MDI-II / MDI-X cross over for easy expansion
- Port trunks (aggregation) for server / network backbone connections
- Port-based VLAN support to enhance security / network performance
- 802.1p priority queues, port-based QoS
- IEEE 802.3x flow control
- Configuration through web-based management
- 19" rackmount installation
- Includes NetProtect standard (10x5x8) - 1 Year onsite maintenance (Australia only)

Rent* $16.42/wk

N1047 **$1,465**

-LINK 24 PORT 10/100Mbps WEBSMART SWITCH

TH 2 COMBO MINI GBIC
S-1226G

24 PORT

ebSmart switch
x 10/100Mbps auto-negotiating ports
x Combo 1000BaseT / Mini GBIC ports for flexible gabit connection
uto-negotiation of MDI-II / MDI-X cross over for easy pansion
rt trunks (aggregation) for server / network backbone nnections

- Port-based VLAN support to enhance security / network performance
- 802.1p priority queues, port-based QoS
- IEEE 802.3x flow control
- Configuration through web-based management
- 19" rackmount installation
- Includes NetProtect standard (10x5x8) - 1 Year onsite maintenance

Rent* $7.50/wk

9093 **$669**

DFL-700 FIREWALL

NEW

The new DFL-700 network security appliance is an easy-to-deploy VPN and firewall solution designed for small to medium businesses that demand superior performance and security. This appliance provides integrated Network Address Translation (NAT), SPI Firewall, advanced content filtering features, IDS protection, bandwidth management, as well as Virtual Private Network (VPN) support. The DFL-700 hardware includes a trusted LAN port, a WAN port that supports virtually all WAN connection types, and an independent DMZ port to support local servers such as e-mail, Web, and FTP. Supports up to 200 VPN tunnels

Rent* $11.19/wk

P5967 **$999**

WHAT IS THE WEBSMART SWITCH?

The Websmart switch provides manageability at the price of an unmanaged switch.

What the WebSmart Switch provides:

- Web based configuration
- Port based VLAN
- Port trunking
- Port based QoS
- Port mirroring
- Port setting for speed, duplex mode or status of flow control. Auto-discovery utility will find all D-link Web Smart Switches on the network. Ideal for the small office that requires the ability to make changes to their network without the requirement of a fully manageable switch.

***RENTSMART**

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PLEASE NOTE:

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POWER BACK-UP EQUALS POWER PROTECTION

BIOPOD
APC BIOMETRIC PASSWORD MANAGER

As security concerns continue to grow, so do the number of passwords. The Biometric Password Manager provide users a convenient and secure way to manage and access multiple security phrases and codes. This product reads and identifies users by their fingerprint and allows them to automatically access password protected applications and web sites.

P5698 **$99**

PERSONAL SURGE ARREST WITH TELEPHONE PROTECTION

A0098 **$89**

BACK-UPS ES 350/500

BACK-UPS ES 350VA

E1093 **$209**

BACK-UPS ES 500VA

E1093 **$295**

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APC TRAVELPOWER CASE

FITS 15" NOTEBOOKS

This innovative and stylish carrying case, constructed of high quality materials, is designed to both protect and power your notebook computer, mobile phone and handheld. Connecting to a single air, auto or standard ac power outlet provides the power to charge and use all your devices. This integrated power system helps reduce weight and cord clutter since bulky transformer blocks and power adapters are no longer necessary. Carefully designed for convenience and durability, the APC TravelPower Case is the ideal choice for any mobile professional.

TRAVELPOWER CASE SMALL

N1792 **$169**

TRAVELPOWER CASE MEDIUM

N7827 **$189**

TRAVELPOWER CASE LARGE

P6052 **$249**

BACK-UPS RS FOR WORKSTATIONS

Smart battery backup & high performance surge suppression

Including additional outlet for protection of printers, audible alarms, phone/modem protection and user replaceable hot swappable batteries. PowerChute® Plus software.

Ideal for:

APC BACK-UPS RS 500VA

H2003 **$395**

APC BACK-UPS RS 1000VA

J5134 Rent* $9.52/wk **$849**

SMART-UPS USB WITH POWERCHUTE PLUS

Power protection for mission-critical applications

- LED status display with on-line, on battery, replace battery and overload indicators
- Auto Diagnostic Testing
- Automatic Voltage Regulation (AVR)
- CellGuard intelligent battery management
- Pager notification
- Network-grade line conditioning

SMART-UPS 1000VA USB WITH POWERCHUTE PL

D9337 Rent* $14.52/wk **$1,29**

SMART-UPS 1500VA USB WITH POWERCHUTE PLUS

D4218 Rent* $19.00/wk **$1,69**

WatchGuard

HE WORLDS FIRST - Firebox X WITH LIFETIME WARRANTY AND SUPPORT

HE WORLD'S FIRST FULLY PGRADEABLE INTEGRATED ECURITY APPLIANCE

WatchGuard Firebox X

"Firebox X is designed to be the world's first fully upgradeable, integrated security appliance that adapts and expands with your changing security needs."

REBOX X500 TARGET CUSTOMER PROFILE:

all businesses, with approximately 20-100 networked rs, generally housed in a single location, or as a ote/branch office, who need a security solution y can install and vitually leave alone.

FIREBOX X700 TARGET CUSTOMER PROFILE:

Small, growing businesses, with approximately 50-250 networked users, generally housed in a single location, or as a branch or remote office, who need a security solution that will grow with their business.

ETSAFE

NetSafe LIFETIME BUNDLE

REWALL SYSTEMS "NETSAFE" CLUDES LIFETIME WARRANTY D SOFTWARE UPDATES

ears LiveSecurity/RTB US Warranty/Firewall nned every 6 months for 3 years/30% off tchGuard Certificate training

EBOX X500 NETSAFE BUNDLE	Rent* $43.51/wk	
3728		**$4,599**
EBOX X700 NETSAFE BUNDLE	Rent* $50.74/wk	
3734		**$5,499**

FAILSAFE

FailSafe LIFETIME BUNDLE

FIREWALL SYSTEMS "FAILSAFE" INCLUDES LIFETIME WARRANTY AND SOFTWARE UPDATES

3 years LiveSecurity/Next Business Day Hardware Replacement/Firewall Scanned every 6 months for 3 years/30% off WatchGuard Certificate training

FIREBOX X500 FAILSAFE BUNDLE	Rent* $50.74/wk	
P6726		**$5,499**
FIREBOX X700 FAILSAFE BUNDLE	Rent* $59.97/wk	
P6732		**$6,499**

EBSAFE

WebSafe LIFETIME BUNDLE

EWALL SYSTEMS "WEBSAFE" LUDES LIFETIME WARRANTY D SOFTWARE UPDATES

ar Live Security/Next Business Day Hardware lacement/WebBlocker updates/Firewall Scanned y 6 months for 3 years/30% off WatchGuard lificate training

EBOX X500 WEBSAFE BUNDLE	Rent* $59.63/wk	
3730		**$6,699**
EBOX X700 WEBSAFE BUNDLE	Rent* $73.87/wk	
3736		**$8,299**

MAILSAFE

MailSafe LIFETIME BUNDLE

FIREWALL SYSTEMS "MAILSAFE" INCLUDES LIFETIME WARRANTY AND SOFTWARE UPDATES

3 year LiveSecurity/Next Business Day Hardware Replacement /SpamScreen updates/Firewall Scanned every 6 months for 3 years/30% off WatchGuard Certificate training

FIREBOX X500 MAILSAFE BUNDLE	Rent* $63.19/wk	
P6727		**$7,099**
FIREBOX X700 MAILSAFE BUNDLE	Rent* $78.32/wk	
P6733		**$8,799**

All bundles available for X1000 & X2500. Please call Harris Technology for more information.

WEBBLOCKER:

Controls web access for users or groups, throught a regularly updated database.

SPAMSCREEN:

Screens junk e-mail, reducing network traffic and increasing employee productivity.

LIVESECURITY:

Keeps your security systems up-to-date. Every Firebox X System includes an initial renewable term of LiveSecurity backed by world-class security experts, support, software updates, threat alerts and responses, support flashes, editorials, and on-line self-help tools.

ULTRASAFE

UltraSafe LIFETIME BUNDLE

FIREWALL SYSTEMS "ULTRASAFE"

INCLUDES Lifetime Warranty and SOFTWARE Updates (2 X Firebox X and High Availability)

3 year LiveSecurity/24x7x4 OnSite/ WebBlocker/SpamScreen updates/ Firewall Scanned every 6 months for 3 years/30% off WG training

FIREBOX X500 ULTRASAFE BUNDLE	Rent* $148.83/wk	
P6729		**$18,499**
FIREBOX X700 ULTRASAFE BUNDLE	Rent* $177.79/wk	
P6735		**$22,099**

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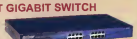
NetComm®

NETCOMM BROADBAND SOLUTIONS

WEB BASED MANAGED SWITCHES

NETCOMM 16 PORT WEB SMART GIGABIT SWITCH

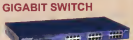


16 x 10/100/1000 Gigabit Web Managed Rackmountable

NP3016 Rent* $10.25/wk

P2350 **$915**

NETCOMM 24 PORT WEB SMART GIGABIT SWITCH



24 x 10/100/1000 Gigabit Web Managed Rackmountable

NP3024 Rent* $13.28/wk

P2351 **$1,185**

MOBILE VPN FIREWALL VPN100

Access your corporate or home network from wherever you are in the world with the NetComm Mobile VPN Firewall Router. Just connect the NetComm Mobile VPN Firewall to your Notebook's USB port and access your network resources remotely from a hotel or another office via the Internet. Advanced security features such as an active SPI firewall also ensure that you are protected from hackers.

N2957 **$149**

Collect 500 FlyBuys bonus points when you purchase N6026 between 01/09/04 - 30/09/04

Standard FlyBuys terms and conditions apply visit www.flybuys.com.au or call 13 1116 for details

500 FlyBuys BONUS POINTS

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NETCOMM LOAD BALANCING ROUTER

NB740

BOOST INTERNET PERFORMANCE AND RELIABILITY WITH DUAL ISP CONNECTIONS

The NetComm NB740 Load Balancing Router combines the performance of two broadband connections in a single, easy to manage network gateway. Along with gateway security, the NetComm NB740 allows you to determine how your Internet traffic is shared or it can automatically balance the load according to bandwidth usage levels. The NB740 also offers a level of redundancy through the use of two WAN connections from different ISPs. Should one connection drop out, the NB740 can maintain Internet services by automatically routing data to the active connection.

500 FlyBuys BONUS POINTS

N6026 **$469**

NETCOMM ADSL GATEWAY, PC CARD AND NIC BUNDLE

NB5580W + NP5430 + NP1100 BUNDLE

BONUS 54MbpsPC CARD & BONUS 10/100 NETWORK CARD

ALL IN ONE ADSL GATEWAY WITH 54MBPS WIRELESS + 54MBPS PC CARD + 10/100 PCI ADAPTER

Recommended by PC World due to its features and us friendliness, the NB5580W provides small businesses with a robust and simple to install All-In-One ADSL sharing solution. It combines an integrated ADSL mod Router, 54Mbps 11g Wireless Access Point, advanced Stateful Packet Inspection Firewall, multiple VPN end-point tunnels and a 4 port 10/100 Ethernet switch. Thi provides small businesses with an easy to install solut and secure network communications between wired a wireless services.

N6812 **$299**

NETCOMM NB5540 & NP7032 BUNDLE

INCLUDES 1 WIRELESS PC CARD NP7032

802.11g 54Mbps Wireless Firewall Router offers an active SPI firewall and auto-fallback for existing 11Mbps networks. Also included is the NetComm NP7032 802.11b 32bit Wireless PCMCIA Adapter to connect your notebook PC to a wireless LAN.

J8540 **$179**

WIRELESS HOTSPOT GATEWAY

HS800

10 BONUS WIRELESS PC CARDS NP7032

The NetComm Wireless Hotspot Gateway HS-800 enables any business such as a café, restaurant, hot or even an airport to provide Internet access to individuals with a wireless enabled device such as a notebook or PDA. The HS800 Wireless Hotspot Gateway provides Internet connection for up to 100 users at a time from a single location. Bundled with 10 BONUS Wireless PC cards NP7032.

Rent* $22.40/w

N0761 **$1,99**

ADSL USB/ETHERNET MODEM/ ROUTER

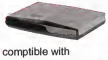
NB1300

In-built ADSL 10/100 Ethernet Modem and Router, delivers simultaneous ADSL services to local network users.

G4025 **$119**

ADSL USB/ETHERNET MODEM/ ROUTER + 4 PORT

NB1300Plus4



Intergrated NAT routing, built-in 4 port switch and fully comptible with all major Australian ISPs.

L2660 **$139**

ADSL MODEM/ROUTER/ SWITCH+ 11b WIRELESS

NB1300PLUS4W

NB1300PLUS4 with integrated 11b Wireless AP, 1 x RJ-11 and 4 RJ-45 10/100BaseT ports

N9656 **$17**

NETGEAR™

EVERYBODY'S CONNECTING WITH NETGEAR

GT634U - 108Mbps WIRELESS EDIA ROUTER

ick up, share, and access your s wirelessly & remotely via USB k drive or memory stick. 10 x eed and 4 x range of 802.11b reless. PCI card also available.

3193 **$279**

G834G - 11/54 Mbps MODEM REWALL ROUTER

SL modem, router, 4 port /100 Ethernet switch, 802.11g Mbps wireless access point and T/NAT Firewall.

2609 **$285**

S318 - CABLE/DSL PROSAFE REWALL ROUTER

PN tunnels, Firewall, 8 x 10/100 tch, easy-to-use Web browser- ed setup.

0242 **$255**

M726 - L2 MANAGED ITCH

ayer 2 Management- VLAN, unking, QoS, DiffServ, RADIUS ent, Broadcast storm control 4 10/100 Mbps ports and 2 mbo Gigabit Ethernet ports asy, intuitive browser interface LI for advanced users

Rent* $8.91/wk

2423 **$795**

WGT624 - 108Mbps CABLE/DSL WIRELESS ROUTER

Super Fast! 108Mbps with Super G Technology. 4 x 10/100 switch, SPI and NAT firewall. 802.11b & 802.11g compliant, easy to install, 10 x speed and 4 x range of 802.11b wireless.

L6032 **$179**

WG511 - 11/54Mbps WIRELESS PC CARD

Speeds of up to 54Mbps for office roaming for notebook PC users. PCI and USB versions also available.

H9581 **$89**

FVS328 - PROSAFE VPN FIREWALL WITH DIAL BACK-UP

image for illustration purposes only

50 VPN tunnels, Firewall, L3 routing and 8 x 10/100 with dial backup for auto fail-over.

N0592 **$339**

GSM7312 - 12 PORT L3 MANAGED GIGBIT SWITCH

- 12 RJ-45 ports for Gigabit Ethernet
- 12 SFP slots for optional fiber gigabit connections (shares with RJ-45 port)
- Complete L3 software- OSPF, RIP I/RIP II, Static, VLAN routing
- Complete L2 software- Trunking, VLAN, prioritization, ACL
- Dynamic routing and QoS capabilities for VoIP and video conferencing

Rent* $41.69/wk

L2403 **$4,229**

WG511T - 108Mbps WIRELESS PC CARD

Delivers up to 108Mbps to your notebook PC with Super G Technology (when used with the WGT624 router).
PCI card also available WG311T.

L6030 **$119**

WGR614 - 11/54Mbps CABLE/ DSL WIRELESS ROUTER

54Mbps Wireless Firewall Router with 4 port 10/100 switch.

J2416 **$149**

FWG114P - CABLE/DSL PROSAFE WIRELESS ROUTER

11/54 Mbps Firewall Router with USB print server. 2 VPN tunnels and 4 x 10/100 switch.

L2431 **$379**

GA311 - 10/100/1000 NETWORK CARD

HOT PRICE

- Go gigabit

M2693 **$49**

GS605 - 5 PORT 10/100/1000 SWITCH

RECENT RELEASE

- Go gigabit

P0187 **$179**

GS608 - 8 PORT 10/100/1000 SWITCH

RECENT RELEASE

- Go gigabit

P0189 **$275**

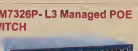
MP101- WIRELESS DIGITAL MUSIC PLAYER

HOT PRODUCT

- Streams and plays MP3s and Windows Media format digital files from all of your networked PCs and Internet radio directly to your home stereo
- Remote control and vivid LCD interface for easy browsing of your music collection
- Listen through your stereo, boom box, headphones, or powered speakers
- Compatible with 802.11b or 802.11g wireless networks

N0441 **$275**

FSM7326P- L3 Managed POE SWITCH



24 10/100 ports, 2 gigabit ports with fiber options, Power over Ethernet (802.3af POE), full L3 & L3 feature set.

Rent* $23.77/wk

M3150 **$2,299**

WG302 PROSAFE™ 802.11G WIRELESS ACCESS POINT

Equipped with advanced security features and comprehensive SNMP functionality. Integrated IEEE 803.3af Power over Ethernet (PoE).

L8310 **$459**

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SERVERLINK

INTELLIGENT KVM SOLUTIONS

SERVERLINK SOHO KVM SWITCHES

AUSTRALIAN MADE

SL-251-P 2 PORT KVM INC. 2 X 2M CABLES

E3692 **$199**

SL-451-P 4 PORT KVM INC. 4 X 2M CABLES

E3694 **$299**

SERVERLINK INFINITY KVM SWITCHES

AUSTRALIAN MADE

SL-221
2 port ServerLink KVM for PS2
B3047 **$259**

SL-421
4 port ServerLink KVM for PS2
A9890 **$345**

SL-821
8 port ServerLink KVM for PS2
Rent* $10.53/wk
97888 **$939**

SL-1621
16 port ServerLink KVM for PS2
Rent* $17.65/wk
97890 **$1,575**

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SERVERLINK STAR KVM SWITCH

"CONTROL TWO PCS FROM ONE CONSOLE"

- Compact in size cables attached
- Select computers with easy hotkey commands

M2084 2 PORT SERVER LINK STAR **$75**

SERVERLINK LCD KVM RACK DRAWER

15" TFT FLAT PANEL

USB MODELS ALSO AVAILABLE Rent* $28.67/wk

H2101 8 PORT PS/2 - 15" LCD **$2,889**

Rent* $33.74/wk

H2103 16 PORT PS/2 - 15" LCD **$3,399**

KVM ACCESS ANYWHERE ANYTIME

"ADD REMOTE IP ACCESS TO YOUR CURRENT KVM SWITCH"

- BIOS Level access to servers via TCP/IP
- Browser based access to your server
- 128bit ssl encryption ensures secure remote connection

Rent* $14.11/wk

K1028 Avocent SwitchView IP **$1,259**

SERVERLINK ELITE KVM SWITCHE

AUSTRALIAN MADE

"8 & 16 PORT 1U HIGH DENSITY SWITCHES"

- On-screen display for simple management
- Supports video resolution up to 2048 x 1536

Rent* $6.15/w

N6589 8 PORT ELITE KVM **$549**

Rent* $7.84/w

N8989 16 PORT ELITE KVM **$699**

SERVERLINK LCD KVM RACK DRAWER

17" TFT FLAT PANEL

USB MODELS ALSO AVAILABLE Rent* $36.71/

N9128 8 PORT PS/2 -17" LCD **$3,69**

Rent* $39.73/

N9129 16 Port PS/2 - 17" LCD **$ 4,19**

KVM OVER CAT 5 BUNDLE

"REDUCE CABLE CLUTTER AT THE RACK"

- Supports PS/2, SUN, USB or serial computer via C 5 RJ45 UTP Dongles
- Includes 16 port KVM, 8 x PS/2 Dongles and rack mount kit

Rent* $22.32/

N5089 Avocent 16 Port Cat 5 Bundle **$ 2,24**

USB & FIREWIRE SOLUTIONS

USB TO PS/2 ADAPTER

KMC-100 USB to PS/2 Keyboard & Mouse Adapter

80557 **$39**

USB 2.0 POCKET HUB

UPH-402
4 port USB 2.0 Pocket Hub

N2301 **$59**

USB SERIAL CONVERTER

UMC-100
USB 9 Pin Serial Adapter

80782 **$55**

USB 2.0 PCI HOST ADAPTER

PCI-502
Port USB 2.0 PCI Host Adapter

N2275 **$39**

USB 2.0 CARD READER

UCR-602
USB 2.0 Multi Card Reader 6-in-1

M8102 **$55**

USB 2.0 DOCKING STATION

UDS-122 USB 2.0 Docking Station Includes: 10/100 Ethernet

N0922 **$149**

FIREWIRE CARDBUS ADAPTER

394-301
Port FireWire Cardbus

N2272 **$59**

USB 2.0 CARDBUS ADAPTER

UCB-202
2 port USB 2.0 Cardbus

N2270 **$59**

FIREWIRE COMBO CARDBUS

UFCB-402 4 port USB 2.0 and FireWire Combo CardBus

P2062 **$99**

4 PORT IEEE1394 FIREWIRE PCI CARD

394-PCI
Port IEEE1394 FireWire PCI card

N8946 **$45**

USB BLUETOOTH ADAPTER

UBT-120
USB Bluetooth Adapter

N2300 **$89**

USB TO INFRARED ADAPTER

UIR-120
USB IrDA Infrared Adapter

N0930 **$69**

USB 2.0 PORTABLE STORAGE

USB 2.0 MINIDRIVE 2.2GB

EMBEDDED
1 inch 2.2GB Hard Disk Drive

UMD-022

P2357 **$449**

USB 2.0 FLASH DRIVES

L2374	32MB	$39
L2375	64MB	$49
L2377	128MB	$69
L2378	256MB	$99
L2379	512MB	$199
L2381	1GB	$399

USB 2.0 HDD ENCLOSURES

UHD-2502

N0959 - 2.5" HDD **$69**

UHD-3502

N0960 - 3.5" HDD **$99**

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LINKSYS®

A Division of Cisco Systems, Inc.

THE WORLDWIDE LEADER IN WIRELESS NETWORKING

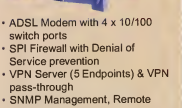
WIRELESS G ADSL GATEWAY - WAG54G

- ADSL Modem with 4 x 10/100 switch ports
- Wireless 802.11G 54MB Access Point, supports both 11MB & 54MB clients
- Wireless Security includes WEP, WPA & 802.1x
- Powerful Stateful Packet Firewall with Denial of Service Attack prevention
- VPN Server, 5 VPN Tunnels - also supports VPN pass-through
- Remotely SNMP manage & upgrade firmware - perfect for Corporate deployments
- 3 Year Exchange Warranty

M5307 **$249**

WIRED ADSL GATEWAY - AG041

RECENT RELEASE



- ADSL Modem with 4 x 10/100 switch ports
- SPI Firewall with Denial of Service prevention
- VPN Server (5 Endpoints) & VPN pass-through
- SNMP Management, Remote firmware download

N9123 **$179**

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WRT54G ROUTER + WPC54G ADAPTER BUNDLE

BUNDLE ROUTER + ADAPTER

4 in 1 Wireless Internet Router, allows you to share your Broadband connection wirelessly, 802.11G Wireless, 4 port 10/100 Ethernet Switch.

N0240 **$239**

802.11 A/B/G TRI-BAND LAPTOP CARD -WPC55AG

The Linksys Dual-Band Wireless A+G Notebook Adapter lets your notebook communicate with all three wireless network standards. With one PC Card, you can connect to Wireless-A (802.11a), Wireless-G (802.11g) and Wireless-B (802.11b) networks.

N0252 **$169**

WIRELESS-G PRINT SERVER FOR USB 2.0 - WPS54GU2 - AU

Wireless 802.11G Print Server allows wireless printing directly to the Print Server without tying up a PC. Supports 1 x USB & 1 X Parallel printer.

N8872 **$329**

WIRELESS G NOTEBOOK ADAPTER SPEEDBOOSTER CARDBUS - WPC54GS

High-speed Wireless-G networking for your notebook computer, now with SpeedBooster performance enhancement, New SpeedBooster technology increases Wireless-G performance by up to 35%. Also interoperates with standard Wireless-G and Wireless-B networks.

N7993 **$155**

WRT54G ROUTER + WUSB54G ADAPTER BUNDLE

BUNDLE ROUTER + ADAPTER

4 in 1 Wireless Internet Router, allows you to share your Broadband connection wirelessly, 802.11G Wireless, 4 port 10/100 Ethernet Switch.

N0241 **$249**

WIRELESS-G BROADBAND ROUTER - WRT54G

4 in 1 Wireless Internet Router, allows you to share your Broadband connection wirelessly, 802.11G Wireless, 4 port 10/100 Ethernet Switch.

H9739 **$165**

WIRELESS VPN BROADBAND ROUTER - WRV54G

The Ultimate 802.11G Wireless, security & Remote Access solution for your business. 802.11G Access Point with advanced SPI Firewall capability & 4 port 10/100 Switch, allows up to 50 VPN clients to remotely access your network.

L5961 **$369**

WIRELESS G BROADBAND ROUTER SPEEDBOOSTER - WRT54GS

Complies with 802.11g and 802.11b (2.4GHz) Standards. SpeedBooster technology increases wireless performance by up to 35%. Enhanced Internet Security Management functions including Internet Access policies with Time Schedules.

N8988 **$229**

802.11G 54MBPS WIRELESS-G PCI ADAPTER - WMP54G

Wireless-G (draft 802.11g) connectivity for your desktop PC. Up to 54Mbps in the 2.4GHz radio band. Interoperates with Wireless-B (802.11b) networks at 11Mbps.

H9737 **$99**

PRINTSERVER FOR USB WITH 4 PORT SWITCH - PSUS4

Also expands your network with a built-in 4 port 10/100 Ethernet switch . Remotely administered through your web browser or the included utility.

L7086 **$125**

WIRELESS-G ACCESS POINT - WAP54G

802.11g
54Mb Wireless Access Point. Add Wireless to your existing Network. Supports WEP & advanced WPA wireless security.

H9736 **$18**

5 PORT 10/100 SWITCH - SD205
8 PORT 10/100 SWITCH - SD208
16 PORT 10/100 SWITCH - SD21

L5968 **$5**

L5969 **$8**

L5970 **$16**

UANTUM PROTECTS YOUR DATA & YOUR BUDGET!

UANTUM PROTECTS THE WORLD'S MISSION-CRITICAL DATA WITH SIMPLE, CALABLE BACKUP SOLUTIONS FROM THE DESKTOP TO THE DATA CENTRE

LT TAPE™ DRIVES AND MEDIA Providing scalable performance coupled with backward-read compatibility to tect existing investments, the DLT tape range is designed for small-to-medium sized enterprises.

LT VS80 - QUANTUM DLT VS80 BARE INTERNAL APE DRIVE

/D/SE SCSI interface. Mounting rews, Quick Install/Start uide, Warranty Card, lour is beige. Black colour ailable. ternal version available.

Rent* $19.04/wk

3110 **$1,699**

DLT VS160 - QUANTUM DLT VS160 BARE INTERNAL TAPE DRIVE

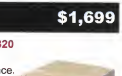
LVD/SE SCSI interface. Mounting screws, Quick Install/Start Guide, Warranty Card, Colour is beige. Black colour available. External version available.

Rent* $26.79/wk

N3114 **$2,699**

DLT 320 - QUANTUM SDLT 320 TERNAL LVD SCSI

ernal mount SCSI 160 interface. , SDLT Docs & Software, ick Install/Start Guide, SCSI umpers, Quantum Super TTape I media cartridge. lour is beige. Black colour d external version available.



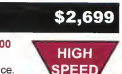
Rent* $53.52/wk

3197 **$5,799**

SDLT 600 - QUANTUM SDLT600 INTERNAL DRIVE

HIGH SPEED

Internal mount SCSI 160 interface. CD, SDLT Docs & Software, Quick Install/Start Guide, SCSI Jumpers, Quantum Super DLTtape II media cartridge. Colour is beige. Black colour and external version available.



Rent* $72.09/wk

N3117 **$8,099**

SERIES AUTOLOADERS

ValueLoader™ brings tape automation to the smaller business at the price of a stand-alone tape drive. award-winning SuperLoader™ eliminates the compromise between capabilities and cost by providing erprise-class features, reliability and capacity at a low cost per GB. Call for DLT VS160, LTO-1, LTO-2, SDLT ' and SDLT 600 versions.

ANTUM VALUELOADER WITH T VS80

BONUS iPod BEFORE 30/09/04*

to 320GB native capacity, B per second compressed formance. Wide Ultra SI-2 LVD interface. ernal version available.

Rent* $54.43/wk

6758 **$5,899**

QUANTUM SUPERLOADER WITH SDLT320

BONUS iPod BEFORE 30/09/04*

Up to 2.5TB native capacity, 32MB per second compressed performance. Wide Ultra SCSI-2 LVD interface.

Rent* $137.30

N5401 **$16,999**

500 - QUANTUM M1500SX TAPE LIBRARY

ive capacity for SDLT 600 of 6.3TB at 36MB/s ive transfer rate . Base-library configurable from o to two drives and up to 25 cartridge slots. Supports LT 320, SDLT 600, and LTO- , and LTO-2™ tape drives. veless configuration available "capacity-only" scalability. ck ten, manage as one.

Rent* $161.53/wk

3880 **$19,999**

M2500 - QUANTUM M2500 TAPE LIBRARY

Base-library configurable from zero to six drives and 100 cartridge slots. Driveless configuration available for "capacity-only" scalability. Supports SDLT320, SDLT600, LTO-1™, and LTO-2™ tape drives. Stack three, manage as one.

N8933 **$39,999**

sit **www.quantum.com/am/products/al/Special_Offers/iPod_promotion_apac.htm** for full details.

QUANTUM DLT VS80

RACKMOUNT, SINGLE DRIVE. QUICK INSTALL.

Quantum DLT VS80 Rackmount, Single Drive. Quick Install/Start Guide, Warranty Card, Power cord, mounting hardware, shunt jumper, SCSI cable.

Rent* $24.65/wk

N3112 **$2,199**

QUANTUM TAPE MEDIA

DLT TAPE IV

CompacTape IV (20/40,35/70&40/80GB) DLT Tape

71231 **$79**

QUANTUM SDLT1

SDLT1 Tape (110/220GB&160/320GB)

B9825 **$105**

QUANTUM SDLT2

Media for the SDLT600

N4918 **$199**

QUANTUM WARRANTY

Available for all models. 3-Year Rapid Exchange Warranty with Telephone & Online Support. On-site installation and on-site service optional.

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BELKIN®

BELKIN CASE, WIRELESS MOBILITY AND KVM SOLUTIONS

BLUETOOTH BOOMLESS MOBILE HANDS-FREE HEADSET

- Works with most Bluetooth enabled mobile phones
- Comfortable SoftHold™ ear hook fits either ear
- Offers clear, high quality sound

N5954 **$175**

CO-PILOT LIVE BLUETOOTH GPS FOR PDAS

- Bluetooth GPS receiver
- Compact and portable
- No wires or cables
- Lightning fast acquisition
- Battery lasts up to 6 hours
- Supports all Windows CE devices with Bluetooth & SD memory slot

Rent* $11.74/wk

N8863 **$1,048**

CO-PILOT LIVE USB GPS FOR NOTEBOOKS

- Drive with confidence!
- Automatic route recalculation
- Detailed verbal instructions
- Concise visual cues
- Large map display
- Works on Notebooks & Tablet PCs

Rent* $9.51/wk

N9176 **$849**

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NEU ELEMENTS - CASE SOLUTIONS FOR YOUR NOTEBOOK

Every case has been designed and manufactured to the ultimate standards in comfort, protection and durability. Smart storage features have been introduced, with more pockets and holders in every bag. All of our cases come with Belkin's Lifetime Warranty.
^BONUS for the month of September only, applicable to all Neu Elements cases only.

BONUS^ Receive a bonus Quadra Pen with you purchase of any Ne Elements bag from Belkin.

NE-17 NOTEBOOK CASE FOR 17" NOTEBOOKS

- Reinforced Honeycomb Frame
- Provides shock damage protection with high-density foam

P0247 **$99**

FREEPORT II BACKPACK

- Padded external support panel for back and shoulder cushioning
- Removable padded computer sleeve

L4274 **$7**

NE-07 NOTEBOOK BAG

- Lightweight design, top loading convenience
- Super soft shoulder strap for ultra comfort
- Pen, disk and accessories storage

L4287 **$59**

NE-TR NOTEBOOK TROLLEY

- Ergonomic shoulder strap and soft, sturdy handle for easy lifting
- Telescoping extendable handle

L4291 **$15**

NE-L01 EXECUTIVE SERIES LEATHER CASE

- Stylish lines and sturdy construction
- Fine grade leather exterior crafting
- Ergonomic shoulder strap

L4280 **$104**

NE-TL2 TOP-LOADING XL CASE

- Lightweight, durable honey-comb constructed frame
- Professional, stylish look

L4284 **$9**

KVM SOLUTIONS

KVM (PS/2 keyboard, VGA video, PS/2 mouse) switches and accessories allow you to control multiple compute from one console (keyboard, video, mouse). KVM switches are a cost effective and space saving alternative to having one console for each computer. Belkin offer a specific KVM device for every need from SOHO applicatio to enterprise networks.

BELKIN 2 PORT KVM SWITCH

With built in cabling

L6584 **$76**

BELKIN ECONOMY 2 PORT KVM

With cables attached, PS/2 & Audio Support

N5955 **$99**

BELKIN OMNIVIEW 2 PORT

Reverse KVM Switch with 1 x all in one cable set

C4662 **$17**

BUNDLED BONUS CABLES WITH ENTERPRISE KVM! SEPT 2004 OFFE

- Provides multi-level security for added protection of connected servers
- Enables expandability without losing a port with dedicated daisy-chain ports
- Includes the powerful yet easy-to-use IntelliView Graphical On-Screen Display (OSD) for extensive control over connected servers
- Offers cross-platform support for USB and PS/2 interfaces
- Supports video resolutions of up to 2048x1526@85Hz

8 KVM SWITCHES	USB	PS2
RENT*	$11.75/wk	$11.75/wk
PART	N6098	N6098
PRICE	$1,049	$1,049

8 x2 KVM SWITCHES	USB	P
RENT*	$12.99/wk	$12.99/
PART	N6141	N61
PRICE	$1,159	$1,15

16 KVM SWITCHES	USB	PS2
RENT*	$15.45/wk	$15.45/wk
PART	N6099	N6100
PRICE	$1,379	$1,379

16 x2 KVM SWITCHES	USB	P
RENT*	$16.80/wk	$16.80/
PART	N6143	N61
PRICE	$1,499	$1,49

CORDLESS AND OPTICAL COMBINATIONS

OGITECH CORDLESS OPTICAL MOUSE BLACK

joy freedom from snagged d tangled mouse cords th the Logitech Cordless tical Mouse. Setup is a eze - just plug the receiver o your PC or Mac and you'll ready to go. The receiver can hidden out of site, and its reliable rdless technology works within a 2 metre range so u're free to move about your desk. This mouse also tures smooth optical tracking, a convenient scroll eel, and Logitech's proprietary power management chnology for extended battery life. It's all wrapped up smooth and comfortable design.

N1387 **$50**

LOGITECH CORDLESS MOUSE COLOUR SELECT

Go cordless the colorful way with the Logitech® Cordless Optical Mouse Color Select. With its changeable anodized red, metallic blue, and bright silver covers, you can personalise your mouse to fit your style. Setting it up is easy just plug the receiver into your PC or Mac and you're ready to go. Its reliable wireless technology works within a 6 foot range so you're free to move about your desk.

Image for illustration purposes only

P6518 **$50**

LOGITECH OPTICAL MOUSE BLACK

The Logitech® Optical Mouse features optical technology for incredibly smooth tracking.

N9100 **$28**

LOGITECH MARBLE MOUSE

- 4 button
- Interfaces: USB and PS/2
- Comfortable for left and right hands

B7946 **$48**

RDLESS DESKTOP SE

Cordless Desktop SE provides better work, play communication in a comfortable design. The dless optical mouse offers true freedom on and your desk with greater accuracy and no cleaning. e-touch buttons give you instant access to your browser, email and multimedia controls

7196 **$93**

CORDLESS MX™ DUO™

We've taken our best keyboard/mouse combination and made it even better. How? By combining the award winning Logitech MX™700 cordless optical mouse with our stylish, ultra-flat cordless keyboard.

H9665 **$195**

LOGITECH ACCESS KEYBOARD PS/2

Value keyboard with detachable palmrest and multimedia/internet buttons. PS/2 hands

F7292 **$38**

LOGITECH INTERNET CHAT HEADSET

H8683 **$37**

E 2.1 SPEAKERS

oy the home reo styling and mium sound ogitech's e speaker tem. Phase satellites and rd winning and patented pressure driver subwoofer hnology produces the high quality sound you expect Logitech. Satellites feature a brushed aluminium , removable grilles, and durable cast metal stands. convenient wired remote control includes a dphone jack, volume and power controls. Adjust system's bass level with the subwoofer volume.

2172 **$189**

Z-680THX® SPEAKERS

The Logitech Z-680 THX is a 500 Watts sound system with built-in Dolby Digital and DTS hardware decoding. Advanced functionality includes Dolby Pro Logic II for 5.1 surround sound from stereo sources. Optical and coaxial outputs allow simple connection to nearly any audio appliance including PCs, TVs, game consoles, CD & DVD players. The Z-680 is all you need to turn your existing audio or video system into a home theatre. 2 year warranty.

G2817 **$495**

LOGITECH STEREO USB HEADSET

H8688 **$70**

LOGITECH DESKTOP MICROPHONE

H8689 **$49**

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TARGUS

Making Your Mobile Life Easier®

GET MOBILE... GET TARGUS

VEHICLE DVD PLAYER TRAVEL CASE

Supports portable DVD players with up to 10" screens

P6540 **$45**

10 CHANNEL WIRELESS MINI OPTICAL MOUSE

Automatically searches up to 10 channels, assuring interference free operation in crowded environments.

P2690 **$99**

SMALL LEATHER CAMERA CASE

Luxurious genuine leather case with shoulder strap fits small to medium cameras

P6594 **$29**

LEATHER CAMERA CASE

Luxurious genuine leather case with shoulder strap fits most DSLR cameras

P6595 **$55**

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NOTEBOOK ACCESSORY VALUE KIT

- **Targus Notebook USB Light:** Soft, gentle glow provides enough brightness to illuminate your keyboard.
- **DEFCON Video Port Combination Lock:** Attach to any computer, projector or LCD monitor equipped with a video port. Up to 10,000 possible combinations can be set or changed at anytime and it includes a steel base plate for added security.
- **Targus Wireless Optical Notebook Mouse:** Ergonomic design, built-in power management with physical on/off switch, and touch sensor for sleep mode.

P6539 **$95**

FREE.SPIRIT RANGE

NOTEBOOK MULTIPAC

- Fits notebooks with screens up to 15.4"
- 2-in-1 solution : messenger case or backpack, you choose!
- Specifically designed CD or MP3 player pocket with headphones port-hole
- Hidden detachable shoulder straps
- Removable mobile phone pocket
- Rubber Compu-Tread™

N6089 **$99**

MESSENGER NOTEBOOK CASE

- Fits notebooks with screens up to 15.4"
- Front pocket for your everyday documents
- Bonus removable slip case
- Specifically designed CD or MP3 player pocket with headphone port-hole
- Hidden detachable shoulder straps
- Rubber Compu-Tread™
- Removable mobile phone pocket

N6088 **$9**

WIRELESS MULTIMEDIA PRESENTER

- **4-in-1 wireless presenter:** Trackball mouse, laser pointer, multimedia and presentation controls all in one
- **Perfect for presentations:** Move around the room up to 15m using 2.4GHz wireless technology
- **Convenient 1-touch hotkeys:** Switch between applications, launch the Internet or access e-mail

P5884 **$179**

WIRELESS CALCULATOR KEYPAD

- **Wireless Freedom:** Wireless keypad with built-in calculator and receiver storage
- **Faster data input:** Full-size keycaps for convenient data input -ideal for spreadsheet, accounting and financial applications
- **Plug and play connectivity:** Easy to install, no drivers required

P6592 **$99**

USB 2.0 MOBILE PORT REPLICATOR

- Connects virtually any PS/2, parallel, serial and USB device
- Add or remove devices without reconfiguring or rebooting your computer
- Compact design saves space o the desktop
- Low cost alternative to docking stations

P2695 **$13**

IP DIGITAL PROJECTORS - SEPTEMBER TRIAL OFFER

ITH SLEEK CURVES, CHIC STYLE, SOPHISTICATED LOOKS AND STATE-OF-THE-ART TECHNOLOGY - OUR VIEW OF DIGITAL PROJECTORS WILL CERTAINLY NEVER BE THE SAME! EAVE YOUR AUDIENCE SPEECHLESS WITH HP DIGITAL PROJECTORS' STYLISH DESIGN, SUPERB OLOUR RENDITION, EXCELLENT CONTRAST, TRUE-TO-LIFE IMAGE PROJECTOION AND SIMPLICITY O USE. WHETHER PRESENTING IN OR OUT OF THE OFFICE OR RELAXING AT HOME WITH A DVD, HP'S ANGE IS THE PERFECT SOLUTION.

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P MP3130 DIGITAL PROJECTOR

ie sophisticated mp3130 digital ojector is the only vertical ojector in Australia. Powerful om, keystone picture correction ertical and horizontal) and the ility to be wireless (optional odule and LAN card required) ves you the convenience of ojecting an image from anywhere the room.

- DLP technology
- 1800 lumens
- XGA
- High 1800:1 contrast ratio
- Zoom lens
- Integrated speaker
- Extremely portable at 1.5kg
- 4000 hour lamp life (eco mode)
- Carry bag included
- 3 years warranty

TRIAL OFFER! See side bar for details

Rent* $38.44/wk

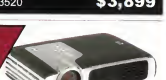
L3520 **$3,899**

P SB21 DIGITAL PROJECTOR

e SB21 digital projector is easy use, weighs just 1kg and fits he palm of your hand. Perfect the home with its extremely h contrast and perfect for any ividual who travels frequently.

- DLP technology
- 1000 lumens
- SVGA
- High 1800:1 contrast ratio
- Extremely portable at 1kg
- Carry bag included
- 2 years warranty

TRIAL OFFER! See side bar for details



Rent* $23.52/wk

G8845 **$2,099**

RSATILE HP VP6110 DIGITAL PROJECTOR

rfect for Serious Home Theatre Entry Level Conference Room. 's high contrast will bring out the st in your DVDs.
LP technology
500 lumens
VGA

- High 2000:1 contrast ratio
- Picture-in-Picture feature
- Integrated 3-watt speaker
- Lamp Saver mode (3000 hours)
- 2.9kg
- 2 year warranty

Rent* $22.94/wk

K1729 **$2,315**

RSATILE HP VP6120 DIGITAL PROJECTOR

rfect for the Conference Room h HP's impressive brightness, ge quality and XGA resolution.
LP technology
000 lumens
GA

- High 2000:1 contrast ratio
- Picture-in-Picture feature
- Integrated 3-watt speaker
- Lamp Saver mode (3000 hours)
- Ceiling mountable/portable 2.9kg
- 2 year warranty

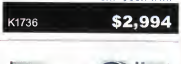
Rent* $30.71/wk

K1736 **$2,994**

GH-END HP XP8010 DIGITAL PROJECTOR

hree-in-one projector with ovative 3-position dual colour eel projection technology that es you 3 modes of operation. oose one of these modes of eration: Graphics - gives you ht and colourful business phics, Video - provides atre-like colour saturation, and Grayscale - maximum of 3600 lumens is achievable in this mode.

- DLP technology • 2600 lumens (normal operation) • 3600 lumens (grayscale-mode operation)
- XGA • Kensington Lock
- Theft Alert • 4000 hour lamp life (eco mode) • Ceiling mountable
- 3 year warranty



Rent* $55.36/wk

M0914 **$5,999**

TRIAL AN HP DIGITAL PROJECTOR AND USE IT AT YOUR LEISURE AT HOME OR AT WORK. ALL YOU HAVE TO DO IS PAY THE COURIER, INSURANCE AND HANDLING COSTS#. EASY!

THERE IS NO OTHER PROJECTOR TRIAL OFFER OUT THERE THAT EVEN BEGINS TO COMPARE!

TRIAL AVAILABLE ON SB21 AND M3130 MODELS ONLY.

* Minimum trial of 2 days and maximum trial of 7 days, with the trial period to be agreed by both parties. Customer is required to reimburse HP costs of the courier (to and from customer's site), insurance and handling.
These costs are $49 per day for the first 7 days, and $99 per day thereafter.
This introductory offer is available once per business or household only.
Offer valid until 30th September 2004 and is subject to availability. Customer is required to enter into HP's Loan Agreement, the terms and conditions of which are set out on the HP web site **www.hp.com.au/promotions**
All prices mentioned are exclusive of GST.

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NEC

LEADERS IN VISUAL DISPLAY TECHNOLOGY

NEC PROJECTORS

VT47G

- 1500 ANSI lumens
- Compact 2.9kg
- SVGA Resolution
- Quiet operations (28dB in Eco Mode)
- Lamp life 2000 hours
- Short focus lens

Rent* $15.68/wk

N9298 **$1,399**

VT470G

- 2000 ANSI lumens
- SVGA Resolution
- Compact 2.9kg
- Security functions
- Quiet operations (32dB)
- Lamp life 2000 hours
- Auto keystone correction

Rent* $24.82/wk

P6583 **$2,400**

VT670G

- 2100 ANSI lumens
- XGA Resolution
- Compact 2.9kg
- Security functions
- Auto keystone correction
- Short focus lens
- Lamp life 2000 hours

Rent* $34.73/wk

P5886 **$3,500**

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15" LCD MONITOR

ACCUSYNC LCD51V

- 1024 x 768
- Available in black & white
- 400:1 Contrast Ratio
- Thin Frame design

Rent* $6.33/wk

K8223 BLACK **$565**

Rent* $6.33/wk

K8222 WHITE **$565**

17" LCD MONITOR

ACCUSYNC LCD71V

- 1280 x 1024
- Available in black & white
- 450:1 Contrast Ratio
- Thin Frame design

Rent* $8.28/wk

K8225 BLACK **$739**

Rent* $8.28/wk

K8224 WHITE **$739**

19" LCD MONITOR

MULTISYNC 1960NXI

- 1280 x 1024
- Analogue and digital inputs
- Wide viewing angle
- Thin Frame design

Rent* $14.17/wk

M6827 BLACK **$1,265**

Rent* $14.17/wk

M1432 WHITE **$1,265**

20" LCD MONITOR

MULTISYNC LCD2080UX

- 1600 x 1200
- Analogue & Digital inputs
- Wide viewing angle
- Thin Frame design

Rent* $25.74/wk

H2935 BLACK **$2,489**

Rent* $25.74/wk

H2859 SILVER **$2,489**

19" CRT MONITOR

MULTISYNC FE991SB

- 1792 x 1344 @ 68Hz
- Flat aperture grille
- SuperBright function

G8754 **$519**

22" CRT MONITOR

MULTISYNC FP2141SB-BK

- 2048 x 1536 @ 85Hz
- Flat aperture grille
- SuperBright function

Rent* $11.64/w

G8755 **$1,03**

SAMSUNG

ISUAL DISPLAY OF CHOICE

7" DIGITAL/ANALOGUE TFT

NCMASTER 173P

- 280 x 1024 resolution
- ixel pitch: 0.264 (mm)
- 00:1 contrast ratio
- rightness: 270 cd/m²
- esponse time: 25ms
- nalogue/digital interface
- ower (On-Mode): 40 Watts (Maximum)
- ual hinge with pivot
- eight adjustment

Rent* $11.08/wk

9029	RED	**$989**

17" MULTIFUNCTION WIDE LCD

SYNCMASTER 730MW

- Brightness 450 cd/m²
- Contrast Ratio 500:1
- Digital/Analogue Interface
- Multimedia Speakers: Attachable speakers 5Watt
- Other include accessories: Remote control
- Weight Net 6.15kg
- Special Features: Integrated TV Tuner.S-video.HDTV ready. PIP function (Auto POP-Up). MagicBright
- Stand: foldable stand

Rent* $15.68/wk

P5689		**$1,399**

" TFT / 12MS RESPONSE TIME

NCMASTER 710N

- 80 x 1024 resolution
- st 12ms response time
- 0:1 contrast ratio
- 0°/140° H/V viewing angles
- agicBright™ and MagicTune™ technology
- rrow bezel design
- ilt-in power supply
- lver model also available

Rent* $8.57/wk

5862	BLACK	**$765**

40" TFT WIDE DUAL INTERFACE

SYNCMASTER 403T

- 40" TFT Wide Format
- Silver, Dual Interface
- Speakers
- Desk Stand
- Contrast Ratio 600:1
- Response time: 23ms

WIDESCREEN LCD TECHNOLOGY

Rent* $87.45/wk

J2678		**$10,429**

DIGITAL/ANALOGUE MONITORS

SYNCMASTER 213T 21.3" TFT MONITOR

- Viewable image size: 21.3"
- Brightness (typical): 250 cd/m²
- Contrast ratio: 500:1
- Analogue/digital interface
- Colour: Silver
- Special features: narrow-bezel design, pivot technology/height adjustable, dual interface

Rent* $27.25/wk

J2605 **$2,635**

***RENTSMART**
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PLEASE NOTE:
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SAMSUNG

QUALITY AND INNOVATION, NO RISK

SAMSUNG TONER

SCX - 4216F MULTI-FUNCTIONAL CENTRE TONER CARTRIDGE

J9653 **$99**

SAMSUNG ML-2551N - 10,000 PAGE TONER CARTRIDGE

L7764 **$239**

SAMSUNG ML-1710 3000 PAGE TONER CARTRIDGE

J2380 **$99**

SAMSUNG ML-2551N OPTIONS

SAMSUNG ML-2551N OPTIONAL ETHERNET/802.11B WIRELESS NETWORK CARD

N2864 **$182**

SAMSUNG ML-2551N OPTIONAL EXTRA 500 SHEET TRAY

J9642 **$264**

SAMSUNG ML-2151N OPTIONAL EXTRA 64MB MEMORY UPGRADE

J9644 **$115**

SAMSUNG ML-2151N OPTIONAL EXTRA 128 MB MEMORY UPGRADE

J9645 **$149**

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SAMSUNG SCX - 4216F

LASER MULTIFUNCTION AT AN INKJET PRICE!

- 16ppm mono laser multifunction
- Printer/Copier/Scanner/Fax + auto document feeder
- Colour scanner
- 33.6 kbps fax
- Telstra Duet compatible
- 250 sheet tray
- Windows only
- USB & IEEE1284 connectivity

J2137 **$499**

SAMSUNG ML - 2551N

NETWORK DUPLEX LASER PRINTER WITH VERY LOW RUNNING COSTS, AT A REALISTIC PRICE

- 24ppm duplex mono laser printer
- 32MB RAM
- 266Mhz processor
- Windows, MAC (OS8.6+) and Linux
- Postscript 3 and PCL 6 emulation
- Ethernet, Parallel and USB 2.0 connectivity
- Cost-per-page as low as 1.8 cents with toner save o
- 8,000 page toner cartridge
- 3 year onsite warranty

Rent* $12.31/w

M4990 **$1,09**

SAMSUNG ML - 1740

MEET THE SMALLEST ONE!

- World's smallest 16ppm mono laser
- 8MB RAM
- 600x600 dpi resolution
- 15,000 sheet duty cycle
- Windows, Macintosh and Linux compatible
- USB, IEEE 1284
- 2 year return-to-base warranty

P2581 **$26**

EPSON PRINTERS

EPSON STYLUS PHOTO R310

15 ppm black
Print directly from a wide range of Digital Cameras using the new PictBridge printing standard
Dedicated memory card slot
True BorderFree printing - up to A4!
Print directly onto the surface of inkjet printable CDs
6 individual colour ink cartridges for economical printing

M5315 **$369**

EPSON STYLUS PHOTO R800

5760 x 1440 optimised dpi using RPM technology
Up to 17ppm for black text A4 (memo) printing
BorderFree printing
8 Individual Colour Ink Cartridges
New UltraChrome Hi-Gloss inks
Direct printing on inkjet printable CD-R and DVD media
Roll Paper
Printing for seamless panoramic prints

Rent* $7.27/wk

C9471 **$649**

EPSON STYLUS PHOTO RX510 MULTI FUNCTION

Print up to 17ppm black, 16ppm colour
5760 x 1440 optimised dpi using Resolution Performance Managment (RPM) technology
Standalone colour copier
Copy speed 10cpm black, 8cpm colour
4800 x 4800 dpi Scanning resolution
USB 2.0 high speed interface

C3169 **$549**

EPSON AL-C900 ACULASER COLOUR LASER

- As affordable and easy to use as a black and white laser
- 16ppm monochrome; 4ppm colour
- 600 dpi with EPSON 2400 RIT
- 200 sheets plain paper plus multipurpose tray
- Parallel and USB
- Windows and MAC platforms

Rent* $10.41/wk

G8809 **$929**

EPSON STYLUS CX6500 INKJET MULTI FUNCTION

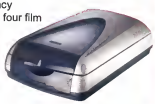
NEW!

- Print up to 22ppm black
- 5760 x 1440 optimised dpi using RPM technology
- EPSON DURABrite INK - for highly durable, water and smudge resistant prints
- Print BorderFree up to A4 prints
- Standalone colour copier
- Flatbed colour image scanner

P5731 **$369**

EPSON PERFECTION 4870 PHOTO SCANNER

- Flatbed colour image scanner
- 4800 dpi with revolutionary MatrixCCD technology
- Integrated Transparency Unit (TPU) supporting four film holders
- Digital ICE - Automatic Scan Cleaning
- USB 2.0 and FireWire interfaces



Rent* $9.18/wk

L9381 **$819**

EPSON PICTUREMATE

THE EASY TO USE PERSONAL PHOTO LAB FOR THE HOME USER

EPSON makes creating photos from your digital camera simple, cost effective and convenient. With the EPSON PictureMate, creating lab-quality, highly durable, glossy photos has never been easier. And for less than 50 cents per photo, creating photos at home has never been more affordable!

- Lab quality 100 x 150mm border free photos without the need for a computer
- Support for most available digital camera memory cards (Compact Flash, Smart Media (Max 128MB), Memory Stick, Magic Gate Memory Stick PRO, Memory Stick Duo, Microdrive, SD Memory Card, Mini SD Card, MultiMedia Card, xD Picture Card)
- Individual ink cartridges
- EPSON UltraChrome ink - featuring new red and blue ink for brighter photos
- Print photos directly from your PictBridge compatible digital camera
- Print directly from Bluetooth compatible mobile camera phones with the optional Bluetooth adaptor

P1646 **$359**

***RENTSMART**
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Canon
advanced simplicity

LATEST NEW RELEASES!

CANON MV700I MINIDV

- Powerful and high resolution Canon 18x zoom lens
- Stylish, compact and ultra modern design that's both comfortable to use and looks the part
- High resolution 800k pixel CCD and DIGIC DV signal processing for outstanding image quality
- Large side-mounted control buttons for simple operation ideal for anyone new to video

Rent* $9.63/wk

N0867 **$860**

CANON MV730I MINIDV

Rent* $11.82/wk

N0866 **$1,055**

CANON MV750I MINIDV

Rent* $14.56/wk

N0864 **$1,299**

ACCESSORIES

CANON CP-220 PORTABLE CARD PHOTO PRINTER

N9472 **$294**

CANON POSTCARD PAPER + INK PACK - 36 SHEETS

G0922 **$35**

CANON POSTCARD PAPER + INK PACK - 108 SHEETS

N8097 **$69**

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CANON POWERSHOT A95

Intuitive control. Feature packed.

- 5 Megapixel
- Canon 3x optical zoom lens
- Movie recording and playback with sound
- DIGIC Imaging Processor delivers superior digital photos
- Print/Share Button allows easy 'one push' printing of images straight from the camera

Rent* $7.61/wk

P6544 **$679**

CANON POWERSHOT A400

Affordable, class leading features and style.

- 3.2 Megapixel
- Retractable Canon 2.2x optical zoom lens
- Movie recording and playback with sound.
- DIGIC Imaging Processor delivers superior digital photos
- Print/Share button allows easy 'one push' printing and downloading of images

P6546 **$299**

CANON POWERSHOT A85

Powerful features. High image quality.

- 4.0 Megapixel
- Canon 3x optical zoom lens.
- Movie recording and playback with sound
- DIGIC Imaging Processor delivers superior digital photos
- Print/Share button allows easy 'one push' printing of images straight from the camera

P2530 **$549**

CANON POWERSHOT S70

High resolution with wide angle lense.

- 7.1 Megapixel
- Canon wide angle 3.6x optical zoom lens
- Movie recording and playback with sound
- DIGIC Imaging Processor delivers superior digital photos.
- Print/Share button allows easy 'one push' printing and downloading of images

Rent* $12.31/wk

P6547 **$1,099**

CANON POWERSHOT G6

Decisive control. Unrivalled performance.

- 7.1 Megapixel
- Direct photo printing capability to PictBridge compatible printers
- DIGIC Imaging Processor delivers superior digital photos
- Canon 4x optical zoom lens
- Movie recording and playback with sound

Rent* $13.43/wk

P6548 **$1,19**

POWERSHOT A75 AND CP-220 BUNDLE

All you need to shoot & print your photos

CANON POWERSHOT A75

3.2 Megapixel. Canon 3x optical zoom lens. Movie recording and playback with sound. DIGIC Imaging Processor. Print/Share Button.

COMPACT PHOTO PRINTER CP-220

Produces brilliant photo prints and stickers anytime, anywhere directly from a PictBridge compatible digital camera. Delivers high quality postcard prints in approx 85 seconds.

Offer available from 1st September to 31st October 2004, while stocks last.

Products available separately :

N0159	PowerShot A75 camera	$449
N9472	Compact Photo printer CP-220	$294

Image for illustration purposes only

Rent* $6.71/w

P6549 **$59**

NEW RELEASES!

PIXMA IP 4000
UTSTANDING PHOTOS AND OCUMENTS

NEW!

Contrast PLUS 5 Ink
Mono 25ppm
Colour 17ppm
pl 4800 dpi
Camera Direct Printing

- **Advanced Media Handling:**
  - Auto Duplex Printing
  - DVD/CD Direct Pinting
  - 2-way Paper Feeding

P6073 **$299**

PIXMA IP 3000
UNBEATABLE VALUE. HIGH QUALITY PHOTOS AND DOCUMENTS

NEW!

- Mono 22ppm
- Colour 15ppm
- 2 pl 4800 dpi
- Camera Direct Printing

- **Advanced Media Handling:**
  - Auto Duplex Printing
  - DVD/CD Direct Pinting
  - 2-way Paper Feeding

P6076 **$249**

IXMA IP 1500
IGH PERFORMANCE PHOTOS AND OCUMENTS AT HOME

NEW!

Mono 18 ppm
olour 13ppm
orderless Printing
pl 4800 dpi
ompact design

6077 **$129**

PIXMA IP 1000
QUALITY DOCUMENTS MADE SIMPLE

NEW!

- Mono 14ppm
- Colour 11ppm
- 5 pl 4800 dpi
- Compact Design
- 5" x 7" Borderless Printing

P6078 **$89**

i80 WIRELESS BUBBLEJET

NB. Camera not included

- Up to 14ppm in mono
- Up to 10ppm in colour
- Up to 4800 x 1200 dpi resolution
- USB for PCs & MAC

N0283 **$399**

i990 BUBBLEJET PRINTER

NB. Camera not included

- Up to 16ppm in mono
- Up to 12ppm in colour
- Up to 4800 x 2400 dpi resolution
- Borderless printing
- USB for PCs & MAC

Rent* $6.49/wk
J0515 **$579**

CANON i9950 A3 PHOTO PRINTER

NB. Camera not included

- Up to 4800 x 2400 dpi printing
- Borderless photos up to A3+
- Up to 16ppm in black and 12ppm in colour

Rent* $10.74/wk
N6584 **$959**

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Canon
advanced simplicity

ADVANCED SIMPLICITY

imageCLASS MP730
ALL-IN-ONE PRINTER, COPIER, SCANNER & FAX

- Up to 22ppm mono & 14ppm in colour
- 4800 x 1200 dpi print resolution
- Standard with automatic 30 page document feeder
- Prints photos directly from 5 different types of memory cards
- Separate ink tanks to significantly reduce printing costs

J4652 **$529**

imageCLASS MP 730 BLACK CARTRIDGE
81586 **$19**

imageCLASS MP 730 CYAN CARTRIDGE
81587 **$16**

imageCLASS MP 730 YELLOW CARTRIDGE
81589 **$16**

imageCLASS MP 730 MAGENTA CARTRIDGE
81588 **$16**

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imageCLASS MP 700
All-in-one Printer, Copier, Scanner

- Prints from memory card
- Up to 22ppm black & 14ppm colour
- Scanning up to 1200 x 2400 dpi
- High speed copying up to 22 cpm black and 14 cpm colour

J2415 **$419**

imageCLASS MP360
All-in-one Printer, Copier, Scanner

- Up to 18 ppm black & 12 ppm colour
- 4800 x 1200 dpi print resolution with 48 bit input and 24 bit output
- Borderless, full-bleed printing and copying on A4, 5" x 7" & 6" x 4" photo
- Advanced Microfine Droplet Technology to eliminate graininess of image
- High-speed copying: 18 cpm black, 12 cpm colour

L1318 **$259**

imageCLASS MP370
All-in-one Printer, Copier, Scanner

- Up to 18ppm mono & 12ppm colour printing
- 4800 x 1200 dpi print resolution
- Scanning at 1200 x 2400 dpi optical

L1319 **$325**

imageCLASS MP390
All-in-one Printer, Copier, Scanner & Fax

- Up to 18ppm mono & 12ppm colour printing
- 4800 x 1200 dpi print resolution
- Scanning at 1200 x 2400 dpi optical

N0289 **$399**

CS 5200F
Colour flatbed & film scanner

FILM SCANNING

- 2400 x 4800 dpi optical resolution
- 48-bit input / 48 or 24-bit output
- 35mm mounted slides (negatives/positives): 4 frames
- Dust and Scratch Reduction: FARE Level 2
- Fast USB 2.0 high-speed interface.
- One-Touch Buttons: 4 Buttons - Copy, Scan, PDF (File); E-mail
- Multi-Scan Mode (Photo)
- Text Recognition

N6611 **$319**

CS LiDE 35
Amazingly slim, feature packed scanner.

NEW!

- 1200 x 2400 dpi optical resolution with 48-bit colour depth.
- Fast USB 2.0 high-speed interface.
- Compact and stylish design.
- PDF file function creation from scans.
- Advanced Z-Lid for scanning of bulky items.

P6166 **$149**

HP PRINTADVANTAGE PUTS YOUR PRINT NETWORK ON AUTO-PILOT

SIT BACK AND RELAX AS HP PRINTADVANTAGE PUTS YOUR BUSINESS IN TOUCH WITH THE LATEST PRINTING TECHNOLOGY.

eplacing the conventional pay-per-page system, HP PrintAdvantage now integrates all of your printing costs under he fixed monthly payment. This fee covers everything from hardware and supplies to personalised service. But he benefits are far from just financial. HP PrintAdvantage offers toner delivery next day and worry-free printing with n upgraded 3 year warranty. So let HP PrintAdvantage take control of your print network and enjoy simple, cost-ffective printing that lets you get on with the jobs that really count.

o find out more call Harris Technology on 1300 788 950 to speak to our sales team or og on to hpprintadvantage.ht.com.au.

HP COLOR LASERJET 3500 AND PRINT ADVANTAGE LEVEL PAY CONTRACT

- Fast 12ppm black & white and colour printing
- 600 dpi with ImageREt 2400
- Smart printing technology with toner level supply status and LCD control panel
- Easy access to supplies via one door
- 64MB built-in memory
- USB interface
- 350 sheet input capacity

N9297 RENT ONLY/PER MONTH# **$192.79**

P COLOR LASERJET 3700DN ND PRINT ADVANTAGE LEVEL PAY CONTRACT

- Fast 16ppm black & white & colour printing
- 600 dpi with ImageREt 2400
- Installed HP Jetdirect 615n Fast Ethernet internal EIO print server so the printer can be shared with a small workgroup up to 15 users.
- PCL 6 and Postscript 3 emulation
- 64MB built-in memory, expandable to 448MB
- 350 sheet input capacity

N9299 RENT ONLY/PER MONTH† **$399.43**

Terms and Conditions:
Based on 36-month finance agreement by an independent rental company (Rentsmart), terms and conditions apply.

#Covers hardware, support, services and supplies. Total cost based on 3 year rental: $4,512.22. Supplies include 16 toner cartridges which cover 500 printed pages per month with 20% coverage.

†Covers hardware installation, support, services and supplies. Total cost based on 3 year rental: $11,370.93. Supplies include 36 toner cartridges which cover 1250 printed pages per month with 20% coverage.

Please note supplies excludes paper. Financing provided by an independent third party and is subject to approval and availability. Above rates are based on a 36-month financing term, excludes delivery charges. Installments are payable weekly or monthly in advance. Actual weekly or monthly payments depend on the exact system selected, term of financing and then applicable rates. Down payment and other credit enhancements may apply. Rates are subject to change without notice. Other terms and conditions apply.

For Finance enquiries, please contact 1300 855 631.

PLEASE NOTE:
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invent

MULTIFUNCTION AND LASERJET PRINTERS

HP LASERJET 1010 SERIES

- Fast 12ppm
- USB 2.0 only
- 8MB RAM
- 150 sheet input tray
- 600 x 600 dpi with REt
- 5,000 page duty cycle

L0085 **$329**

HP LASERJET 1015 SERIES

- Fast 14ppm
- USB 2.0 and Parallel
- 16MB RAM
- 150 sheet input tray
- 1200 dpi effective output
- 7,000 page duty cycle

L0114 **$439**

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CASH BACK OFFER

For a limited time receive **$250 cash back** when you purchase an HP LaserJet 2300 series printer and **$350 cash back** when you purchase an HP LaserJet 4200 series printer. Purchases must be made between 1 August - 31 October 2004. For cash back claim form and full terms and conditions, visit **www.hp.com.au/promotions** or call 1800 00 47 00.

HP LASERJET 2300 SERIES

- Prints up to 24ppm
- HP Fast & ProRes 1200
- 32MB expandable to 288MB
- 250 sheet tray & 100 sheet multi purpose tray
- 50,000 pages per month duty-cycle

		Rent* $15.74/wk	
H9828	HP LJ 2300		**$1,405**
		Rent* $17.09/wk	
H9829	HP LJ 2300D		**$1,525**
		Rent* $20.27/wk	
H9830	HP LJ 2300N		**$1,809**
		Rent* $23.70/wk	
H9831	HP LJ 2300DN		**$2,115**
		Rent* $26.88/wk	
H9832	HP LJ 2300DTN		**$2,599**

HP LASERJET 4200 SERIES

- Prints up to 33ppm with 300 MHz Processor
- HP Fast & ProRes 1200 - true 1200 dpi at engine speed
- 48MB RAM up to 416MB
- 2 EIO slots
- 150,000 page duty-cyle
- 500 sheet tray & 100 sheet multi-purpose tray

		Rent* $21.28/wk	
G4255	HP LJ 4200		**$1,899**
		Rent* $26.88/wk	
G4256	HP LJ 4200N		**$2,599**
		Rent* $31.27/wk	
G4257	HP LJ 4200TN		**$3,049**
		Rent* $34.29/wk	
G6459	HP LJ 4200DTN		**$3,455**

HP LASERJET 4100 MFP

- Up to 24ppm
- 600 dpi (1200 dpi Pro & FastRes)
- Copier at 24cpm & 30 page ADF
- Scanner 600 dpi colour
- 64MB up to 256MB - 5GB HDD
- 1 x 100 sheet multi purpose tray
- 1 x 500 sheet input tray
- 150,000 pages per month duty cycle
- Parallel & Jetdirect 615n print server

		Rent* $43.51/wk	
E3829			**$4,599**

HP LASERJET 3015 MULTIFUNCTIONAL PRINTER (MFP)

ALL-IN-ONE PERFORMANCE

- Print & copy up to 14ppm
- 600 x 600 dpi using REt technology & FastRes 1200
- Space-saving design
- Fast 33.6kps fax modem
- 32MB RAM
- Media flexibility with input tray, priority feed & automatic document feeder
- 7,000-page monthly duty-cycle

M7636	3015 MFP		**$439**
		Rent* $7.83/wk	
M7638	3030 MFP		**$699**
		Rent* $10.86/wk	
M7639	3380 MFP		**$969**

DESKJETS

HP 5510 OFFICEJET ALL-IN-ONE

Print up to 12ppm black and 10ppm colour
1200-rendered dpi black
PhotoREt 3 resolution
Borderless photo printing for A4 and 4" x 6" sizes
70 speed dials with 70 page memory
USB interface for PCs and MAC
150 sheet input tray
Up to 3,000 pages per month duty cycle

15279 **$339**

HP 3380 OFFICEJET ALL-IN-ONE

- Print up to 19ppm (A4)
- Resolution 1200 by 1200 dpi
- Scan resolution 600 x 600 dpi optical & 9600 x 9600 dpi enhanced resolution
- Scan quality up to 24-bit colour images
- 33.6 Kbps fax modem;
- Copy speed up to 19 copies per minute
- Media handling 250 sheets covered input tray
- Up to 10,000 pages per month maximum duty cycle

Rent* $10.86/wk

M7639 **$969**

HP OFFICEJET 7140xi PRINT-FAX-SCAN-COPY

- Print up to 4800 optimised dpi in colour
- Up to 2400 x 1200 dpi in composite black on premium photo papers
- Print method: drop-on-demand thermal inkjet printing
- Print and copy up to 22ppm black and 18ppm colour
- 125 page fax memory and 100 speed dials
- 5,000 page duty cycle
- USB connectivity

Rent* $11.64/wk

H9166 **$1,039**

HP DESKJET 5652

Prints up to 21ppm black and 15ppm in colour
Up to 4800 x 1200 optimised dpi resolution
MB memory
50 sheet input tray

0316 **$259**

HP SCANJET 3770

NEW!

- 1200 x 2400 dpi hardware resolution
- 48-bit color Transparent Materials Adapter (TMA) (2 slides or 2 negatives) built into the scanner lid
- Reduction optics technology with CCD sensor and OCR capability
- New, slim product ID-3-button front panel (scan, copy, or launch HP Instant Share™)
- High speed USB connectivity
- HP Image Zone software

P6004 **$249**

HP DESKJET 450wbt MOBILE PRINTER

- Bluetooth card included
- 9ppm in black & 8ppm in colour
- 45-page sheet feeder
- 1200dpi black & up to 4800 x 1200 optimised dpi colour (PhotoREt 4)
- HP PCL 3 enhanced
- Window and MAC compatible

N5950 **$499**

HP BUSINESS INKJET PRINTER 1100d

- Up to 23ppm black & up to 20ppm colour in fast mode
- Up to 1200 x 1200 dpi black & 4800 x 1200 optimised - dpi colour
- 8MB RAM
- Automatic two-sided printing

HP BUSINESS INKJET 1100d

L0136 **$345**

HP BUSINESS INKJET 1100dtn

L0151 **$499**

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KONICA MINOLTA

THE FUTURE IN IMAGING

KONICA MINOLTA MAGICOLOR® 2350

BONUS MP3 PLAYER

SPECIFICATIONS:

If good things come in small packages, then the magicolor® 2350 has great things to offer. This colour laser printer is smaller than many computer monitors yet despite it's modest size the magicolor® 2350 makes no compromises with performance and features.

- Print Speed - up to 17ppm A4 in mono, up to 4ppm in colour
- Resolution - 9600 x 600 dpi
- Interface - Ethernet (10BaseT/ 100BaseTX); USB 1.1, IEEE 1284 parallel
- Compatibility - Windows 95/98/ Me/NT 4.0/2000/XP Macintosh OS X/OS X Classic Linux/Unix

Rent* $19.04/wk

P6519 **$1,699**

***RENTSMART**

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KONICA MINOLTA MAGICOLOR®SC2300W - COLOUR LASER PRINTER AND SCANNER

The convenience of printing, scanning and copying at your desktop. The ScanCopy® 2300W is specifically designed to meet the personal document requirements of office workers.

- Up to 4ppm in colour, 16ppm in monochrome printing and copying
- Windows 98SE/Me/2000/XP
- 32MB RAM Memory
- USB, IEEE 1284 parallel
- Up to A4 200-sheets multipurpose tray
- Direct scan to e-mail

Rent* $11.18/wk

P2302 **$998**

GREAT PRICE

KONICA MINOLTA MAGICOLOR® 2300W - AFFORDABLE COLOUR LASER PRINTER

It's the desktop-size colour laser printer with a small price to match. The magicolor® 2300W is a perfect fit fo small and home offices that need a dependable, user-friendly printer.

- Print speed - up to 4ppm colour A4, 16ppm mono
- Resolution - 1200 x 600 dpi
- Interface - USB 1.1; parrallel
- Windows 98SE/ME/2000/XP

Rent* $8.84/wk

J3802 **$789**

KONICA MINOLTA MAGICOLOR® 7300 - POWERFUL PRINTING PERFORMANCE

The Konica Minolta network ready Magicolor® 7300 brings amazing con-tone quality to Macintosh and Windows workgroups at a price all businesses can afford.

- Colour/Monochrome: Up to 21 ppm A4, up to 11 ppm A3
- Resolution: 9600 x 600 dpi
- 10BaseT/100BaseTX (PC & Macintosh)
- Windows 95/98/Me/NT4/2000 & XP, Linux, Macintosh O9X/OS X

Rent* $43.37/wk

L2156 **$4,399**

BONUS PAGE PRO 1300W

KONICA MINOLTA PAGEPRO 9100N MONO LASER PRINTER - THE PERFECT PRINTING SOLUTION

- 35 ppm in A4, 19 ppm in A3
- 1200 x 1200 dpi resolution
- 64 MB SDRAM Memory
- Duplex up to 26 ppm (A4)
- 64 MB RAM memory (max 512 MB)
- Paper input 700 sheets
- USB, IEEE 1284 parallel, 10/100 BaseTX

Rent* $24.29/wk

P6471 **$2,349**

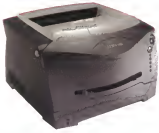
CHECK OUT LEXMARK'S WEBSITE FOR THEIR LATEST PROMOTIONS

LEXMARK X4270
A SMALL OFFICE AND HOME OFFICE WORK HORSE!

- Compact solution combining phone, fax, print, copy & scan
- Black print speeds of 19ppm & fast colour speeds of 10ppm
- 33.6K modem
- 48 speed dial settings
- Fax broadcast function, fax forward function
- Caller ID support
- 1 Year Onsite Exchange LexExpress Warranty

N9595 **$225**

LEXMARK E230
AN EXCELLENT EVERY DAY PRINTER!



- Outstanding performance in a desktop laser
- 17ppm A4 mono laser printer
- 100MHz processor and 8MB standard
- PCL6 emulation
- In-built 250-sheet paper drawer
- USB & Parallel ports standard
- 1 Year Onsite Exchange LexExpress Warranty

N9601 **$269**

LEXMARK X215
THE AFFORDABLE LASER MULTIFUNCTION SOLUTION FOR YOUR DESKTOP

- Printer - 16ppm A4 laser printer & copier
- Copier - including 30-sheet ADF (or flatbed)
- Scanner - colour scan to PC (TWAIN)
- Fax - 33.6Kbps (Super G3) fax modem
- 250-sheet input drawer
- USB & Parallel ports standard
- 1 Year LexExpress Warranty

L4391 **$519**

LEXMARK E232
PERFECT FOR PERSONAL OR BUSINESS APLICATIONS

- Up to 21ppm A4 mono laser printer
- Fast 200MHz processor and 16MB standard
- Less than 8.5 second time to first page
- Optional 550 Sheet Input Drawer
- USB & Parallel ports standard
- 1 Year Onsite Exchange LexExpress Warranty

E2399 **$455**

LEXMARK T630
ULTIMATE SCALABILITY

- 33ppm mono laser
- 32MB RAM (64MB N & DN models)
- 300MHz processor
- Parallel & USB ports standard
- 350-sheet input expandable to 3850-sheets
- 2-Years Next Business Day Onsite Warranty standard
- **Put it on your network** - T630n - K0331 $1,789
- **Print both sides** - T630dn - M4657 - $2,269
- **Make it Multifunction** - X630 - K0359 - $3,779

Rent*$17.13/wk

K0072 **$1,529**

LEXMARK C510
THE HIGH QUALITY DESKTOP PRINTER FOR ALL YOUR COLOUR & MONO PRINTING NEEDS!

- 30ppm mono & 8ppm colour laser
- 64MB expandable to 320MB
- 500MHz processor
- 2400 image quality resolution
- PostScript 3 & PCL6 emulation
- 250-sheet input expandable to 780-sheets
- USB & Parallel ports standard
- 2-Years Next Business Day Onsite Warranty standard
- **Put it on your network** - C510n - N2018 - $2,229

Rent*$11.19/wk

N2015 **$999**

Visit www.lexmark.com.au for your chance to WIN a HOLDEN COMMODORE VY II SV8

Win one of 5 trips to the LEXMARK INDY 300, by purchasing any Lexmark E230 or E232 laser printer before 16/09/2004. See http://ap.lexmark.com/promotions/e2n/ for details.

***RENTSMART**
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PRINTERS & ACCESSORIES

THE NEW VALUE FRONTIER

KYOCERA

KM-2030

- Up to 20ppm A4 / up to 10ppm A3
- 600 x 600 dpi
- 30 Sec warm up: first copy out time 5.5 sec
- Standard 2 x 250-sheet Drawer + 50-sheet Bypass
- 554H x 550W x 603D (mm)
- Approx 46kg

Rent* $35.62/wk

N3346 **$3,589**

***RENTSMART**
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FS-1010

- Up to 14ppm A4
- Power PC 405 200MHz
- 600 x 600 dpi
- 16MB RAM (Max: 144MB)
- Print: 12 seconds to print first page
- 50 + 250 Sheet input
- A4, B5, A5, letter, legal paper sizes
- Parallel + USB 1.1
- 8,000 pages per month maximum duty cycle
- 3 year return to base warranty

D7681 **$549**

FS-3830N

- Up to 33ppm A4
- PC 750 CX/300MHz
- 600 x 600 dpi
- 96MB RAM (Max: 576MB)
- 11.5 seconds to print first page
- 100 + 500 Sheet input
- A4, B5, A5, letter, legal paper sizes
- IB-21E Fast Ethernet + Parallel + Hi-speed USB 2.0
- 175,000 pages per month maximum duty cycle
- 2 year on-site warranty

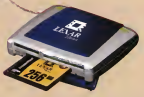
Rent* $20.83/wk

N6150 **$1,859**

MEMORY SOLUTIONS & TECHNOLOGY

LEXAR Media™

LEXAR USB 2.0 MULTI-CARD READER (8-IN-1)



USB 2.0 Multi-Card Reader (8-in-1) (reads 8x different memory cards, a great way to transfer pictures to your PC).

P2638 **$56**

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80X COMPACTFLASH PROFESSIONAL WITH WA

Ultimate performance, speed & reliability - the professional Compact Flash card is 80X Speed Rated (12MB/Sec) and ships with Image Rescue 2.0 software-backed with a Lifetime warranty!

P2635	512MB	$219
P2636	1GB	$449
P2637	2GB	$885

Rent* $9.92/wk

LEXAR SECURE DIGITAL CARD

Great for Storing Pictures, Music and Data. Similar in size to MultiMediaCards, Lexar Media Secure Digital (SD) Cards are designed for use in many digital devices including digital cameras, MP3 players, PDAs, cellular phones and camcorders.

P5929	128MB	$87
P5930	256MB	$128
P5931	512MB	$236

LEXAR MINI SECURE DIGITAL CARDS

Compact format for mobile phone Backwards compatible with standard SD cards - via included adapter.

P6510	32MB	$55
P6512	64MB	$85
P6513	128MB	$129

MATION™ OPTICAL, CD, DVD & TAPE STORAGE

MATION CD-R 52X 700MB/80MIN 0 PACK + BONUS 2 SLIM CASE

P2063 **$9**

IMATION CD-RW 4X 700MB/80MIN 10 + BONUS 2 SLIM CASE

P2064 **$17**

IMATION DVD-R 4X 4.7GB 5 + BONUS 1 JEWEL CASE

P2065 **$17**

MATION 3.5" DSHD IBM 10 ACK BLACK + BONUS 1 NEON ACK

P2066 **$5**

BUSINESS SELECT CD-R 700MB/80MIN 50 PACK

N8499 **$34**

BUSINESS SELECT CD-RW 700MB/80MIN 15 PACK

N8501 **$24**

USINESS SELECT DVD+RW 2X 7GB MOVIE CASE 10 PACK

N8506 **$50**

BUSINESS SELECT DVD-RW 2X 4.67GB MOVIE CASE 10 PACK

N8505 **$50**

BUSINESS SELECT DVD-R 4X 4.7GB MOVIE CASE 10 PACK

N8502 **$37**

NEW!

IMATION DAT72 CARTRIDGE

The DAT72 format offers 72GB of compressed capacity (36GB native) and a 3MB/sec transfer rate. The DAT72 drive is also read/write compatible with DDS3 (12GB) and DDS4 (20GB) cartridges. DAT72 Cartridges are designed exclusively for DAT72 drives and libraries.

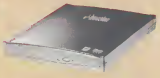
P5939 **$45**

IMATION DISC STAKKA

- Perfect for business, studio and home use, with the Disc Stakka you need never waste time searching for a disk again!
- Stores, protects and retrieves up to 100 of your favourite CDs or DVDs.
- Fully motorised disc insert and eject helps protect your valuable discs.
- Simple to set up, linking to your computer via a single USB cable.
- Supplied with powerful OpdiTracker Disc Management Software - use to capture disc content, and then search an entire database of stored discs by title, keyword, directory or file name.

M4871 **$185**

EXTERNAL DRIVE DVD



The new high performance Imation Slim External DVD Burner lets you create your own custom music and multimedia on DVD recordable up to 4x speed.

- Burn your own custom audio, music or multimedia DVDs and CDs.
- Record and re-record up to 1000 times on just one Imation disc.
- Easily, safely and quickly backup files with up to 4xDVD+/-R or 24x CD-R recording speed.
- Retrieve files at 8x (DVD) and 24x (CD) read spead.
- Windows® 98SE/ME/2000/XP (with latest updates).

N7911 **$379**

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SONY®

SONY OPTICAL AND DATA MEDIA

CD-R MEDIA

CD-R 48X 700MB 80MIN 10 PACK IN JEWEL CASES

E1040 **$9**

CD-R 48X 700MB 80MIN 10 PACK IN SLIM JEWEL CASES

N0273 **$9**

CD-R 48X 700MB 80MIN 25 PACK SPINDLE

L7810 **$17**

CD-R 48X 700MB 80MIN 50 PACK SPINDLE

L7572 **$28**

CD-R 48X 700MB 80MIN 100 PACK SPINDLE

N2887 **$54**

DVD MEDIA

4x DVD-R 4.7GB SINGLE JEWEL CASE

F1256 **$2**

4x DVD-RW 4.7GB SINGLE JEWEL CASE

N1128 **$4**

4x DVD+R 4.7GB SINGLE JEWEL CASE

N0978 **$2**

4x DVD+RW 4.7GB SINGLE JEWEL CASE

L8547 **$4**

PLEASE NOTE:
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SEPTEMBER BONUS TAPE OFFER!!

BUY A 10 PACK OF LTX100G GET 2 BONUS TAPES

P5965 Pack of 10 with 2 bonus Tapes **$554**

BUY A 10 PACK OF LTX200G GET 1 BONUS TAPE

P5966 Pack of 10 with 1 bonus tape **$989**

AVAILABLE FROM 1ST SEPTEMBER TILL 30TH SEPTEMBER 2004 OR WHILE STOCKS LAST! SO ORDER NOW TO SECURE YOUR STOCKS!!

AIT MEDIA

Advanced Intelligent Tape

AIT-1 35-90GB TAPE

B2626 **$95**

AIT-2 50-100GB TAPE

80637 **$99**

AIT-3 100-260GB TAPE

D6119 **$115**

DLT MEDIA

SUPER DLT 160-320GB TAPE

L0008 **$99**

DLT IV 20-80GB TAPE

72426 **$49**

Maxtor

MAXTOR ONETOUCH™ - SMART STORAGE WITH PUSH-BUTTON BACKUP

ONETOUCH™ SERIES

he Maxtor OneTouch™ drive just press the button and your les are backed up in one simple tep. It's simply the faster backup. aster than CD. Faster than a oppy. Faster than removable artridge systems. Space for your hotos, videos, graphics, music, ocuments and more. It connects FireWire or USB ports on a C or MAC. It backs up with the laxtor OneTouch™ button or ns automated backups using e included software, Dantz® etrospect® Express. And you can ustomise the button to launch ny application. Powerful, yet mple backup. Fast, flexible, huge apacity.

QUICK AND EASY INSTALLATION

1. INSTALL THE SOFTWARE
2. PLUG IN THE DRIVE
3. PUSH THE BUTTON AND FOLLOW ON-SCREEN DIRECTIONS

LE

erfect for home or office

xclusive Maxtor OneTouch™

0/120GB

e Maxtor Personal Storage™ external hard drive quickly ds storage and organisational ace through your computer's B port.

1293	80GB	$265
7753	120GB	$295

DV

Perfect for video editing and high-end graphics

Exclusive Maxtor OneTouch™

160/200/250GB

The Maxtor 7200RPM Hard drive featuring both Firewire (IEEE 1394, iLINK) and USB 2.0 interface ports for your PC.

M1296	160GB	$369
K7754	200GB	$439
K7756	250GB	$485
K7757	250GB MAC Firewire only	$429

XT

Perfect for storage-hungry files

Exclusive Maxtor OneTouch™

300GB

With 300GB, the Maxtor external hard drive provides you with enough capacity to hold and organise your storage-hungry applications and files.

K8192	300GB	$535

FEATURES

- Patent-pending Maxtor OneTouch™ technology
- Plug and play storage
- Hot-swappable
- Anodised aluminum design
- Stands vertically or horizontally
- Dantz® Retrospect® Express backup software included
- Customisable Maxtor OneTouch™ button
- Power management and on/off switch
- Whisper-quiet FDB motor
- MAC formatted (for MAC models)
- Oxford 911 chip (Firewire models)
- Connect additional drives
- Kensington security lock compatible

PLEASE NOTE:
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HITACHI
Inspire the Next

HITACHI GLOBAL STORAGE TECHNOLOGIES

ONLY HITACHI OFFERS YOU A FULL STORAGE PRODUCT LINE, SPANNING THE RANGE FROM MICRODRIVE DIGITAL MEDIA, THROUGH TRAVELSTAR (MOBILE), DESKSTAR (DESKTOP), AND ULTRASTAR (SERVER) DRIVES.

MICRODRIVE (DIGITAL MEDIA)

High-capacity, high-performance, removable storage for portable devices. The new 4GB Microdrive lets you carry a whole continent of maps or 1,000 songs in your pocket.

P2510 2GB **$439**

Rent*8.61/wk

P2511 4GB **$769**

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ULTRASTAR SCSI DRIVES BY HITACHI

SERVING UP OUTSTANDING CAPACITY, RELIABILITY AND PERFORMANCE FOR WORKSTATIONS AND SERVERS

- Capacity (GB) - 146GB, 73GB & 36GB models
- Rotational Speed - available in 10,000 RPM & 15,000RPM models
- Interface - Ultra 320 SCSI
- 8MB multi-segmented cache
- Extremely quiet operation
- Average seek time 4.7ms provide outstanding performance
- Enhanced servo technology providing improved performance
- Warranty Period - 5 Year

Rent* $6.33/wk
M6053 73GB/10KRPM 68PIN **$565**

Rent* $6.33/wk
M6054 73GB/10KRPM 80PIN **$565**

Rent* $13.43/wk
M6056 146GB/10KRPM 68PIN **$1,199**

Rent* $13.43/wk
M6057 146GB/10KRPM 80PIN **$1,199**

Rent* $11.42/wk
M6062 73.9GB/15KRPM 68PIN **$1,019**

Rent* $11.42/wk
M6063 73.9GB/15KRPM 80PIN **$1,019**

DESKSTAR (DESKTOP DRIVES)

3.5-inch drives for high-performance personal computers. Hitachi Deskstar drives offer outstanding capacity and performance for advanced desktop applications.

M6037 80GB/7200RPM 2MB UATA **$129**

M6044 160GB/7200RPM 8MB ATA-100 **$195**

M4172 250GB/7200RPM 8MB ATA-100 **$412**

Rent* $9.29/wk
P2705 400GB/ 7200RPM 8MB ATA-100 **$829**

Rent* $9.29/wk
P2704 400GB/7200RPM 8MB SATA-150 **$829**

TRAVELSTAR (MOBILE DEVICES)

2.5-inch drives for mobile computing applications. The Hitachi Travelstar line of drives includes the world fastest and largest mobile drives.

M4849 30GB/4200RPM 2MB **$149**

P2630 30GB/5400RPM 2MB **$165**

P2632 40GB/5400RPM 8MB **$184**

P2633 60GB/5400RPM 8MB **$285**

P2634 80GB/5400RPM 8MB **$410**

LACIE

STORAGE SOLUTIONS

Porsche EXTERNAL HARD DISKS

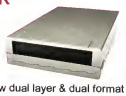
Porsche SERIES	Porsche 80GB	Porsche 160GB	Porsche 250GB	Porsche 160GB	Porsche 250GB
RPM	7200rpm	7200rpm	7200rpm	7200rpm	7200rpm
Interface	USB 2.0	USB 2.0	USB 2.0	FireWire	FireWire
Part	L8441	L8442	L8724	L8444	L8445
PRICE	$229	$299	$429	$329	$459

d2 EXTERNAL HARD DISKS

d2 SERIES	d2 160GB	d2 250GB	d2BD 400GB	d2BD 500GB	d2BD 1000GB
RPM	7200rpm	7200rpm 8mb	7200rpm	7200rpm 8mb	7200rpm 8mb
Interface	USB 2.0, FireWire & F800#				
Rent*			Rent* $10.07/wk	Rent* $11.19/wk	Rent* $21.28/wk
Part	M1192	M1504	M1505	M1506	M2219
PRICE	$399	$529	$899	$999	$1,899

F800 is a new FireWire interface doubling transfer rate (up to 100MB/s) of current FireWire interface. Requires pecific F800 card to take advantage of the performance.

Porsche EXTERNAL DVD±R/±RW /DUAL LAYER



LaCie new dual layer & dual format DVD±R8x designed by FA Porsche w burns 5 different DVD formats 2 CD formats. LaCie Porsche Slim DVD±R drives come in a small sleek sing bus powered through USB D or FireWire. No power supply quired.

rsche DVD±R 8X/ ±RW4X/ 2.4X/CDR24X USB2.0

2137 **$359**

rsche SLIM DVD±R 4X/ W4X USB2.0 BUSPOWERED

3674 **$449**

rsche SLIM DVD±R4X/±RW4X REWIRE BUSPOWERED

3675 **$409**

Porsche MOBILE HD

NB: The key is not included

LaCie mobile drives, designed by FA Porsche, are the perfect companion to back up your notebook or use to transfer data from one computer to another. Made of magnesium and bus powered through the USB 2.0 port, they are the smallest for your back pocket. Weight only 200g and size: 1.7 x 7.6 x 1.3cm.

40GB Porsche MOBILE HD USB 2.0

L8434 **$309**

60GB Porsche MOBILE HD USB 2.0

N6429 **$399**

80GB Porsche MOBILE HD USB 2.0

L8435 **$539**

d2 ETHERNET DISKS

Connect up to 500 users (MAC, PC & Unix) on any type of network. Windows XP embedded. USB 2.0 & FireWire expansion ports to increase capacity easily. Auto-sensing 10baseT & 100baseTX.

160GB 7200RPM, 2MB CACHE ETHERNET DISK Rent* $15.07/wk

J4512 **$1,345**

250GB 7200RPM 8MB CACHE ETHERNET DISK Rent* $16.70/wk

J0705 **$1,490**

500GB 7200RPM 8MB CACHE ETHERNET DISK Rent* $21.46/wk

J0706 **$1,915**

LACIE

Porsche EXTERNAL HARD DISKS

Designed by the world-famous Porsche Design Agency, these LaCie Hard Drives exhibit world-class style and elite performance. Built to be lightweight and durable and can be easily moved for sharing and exchanging data files. Available with Hi-Speed USB 2.0 interface. Other features include effortless setup and secured rubber feet for easy stacking.

D2

EXTERNAL HARD DISKS

LaCie d2 drives have been designed for professional users in mind. Beyond the fact that they are robust, lightweight, fast cooling and noise free, these drives have unique features such as kensington cable lock, autoswitch power on/off with your computer and are rackmountable in 19" rack.

D2

EXTERNAL DVD±R8X & DUAL LAYER (8.4GB) DVD+R2.4X

LaCie d2 DVD±R8x/RW4x/ +R2.4xDL/CD-RW24X is built in the famous professional d2 casing with USB 2.0 & FireWire interface. Includes the following software: Roxio Easy CD&DVD Creator 6.2 DVD edition, Roxio DVDMAX 2.0 & Roxio Toast Lite 6.0 / 5.2.2, as well as all cables, 1 DVD-R media. Dual Layer technology lets you burn 8.4GB capacity on 1 side of new generation DVD+R medium.

N9025 **$399**

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iomega

IS OLD TECHNOLOGY PROTECTING YOUR NEW DATA?

EXTERNAL HARD DISK DRIVE

Iomega External Drives offer a complete solution that makes security, recovery & data storage easy. Complete with Iomega Automatic Backup & Symantec Norton Ghost Disaster Recovery Software. Sleek design, hot plug & play, take it anywhere with USB 2.0 or FireWire connectivity.

80GB USB 2.0
K1437 **$259**

160GB USB 2.0
P2391 **$389**

250GB USB 2.0 / FIREWIRE
Rent* $6.20/wk
L2760 **$554**

IOMEGA NAS 320GB STORAGE SOLUTION

Protect & manage business critical information with a Microsoft Windows NAS server for the small office, small & medium sized businesses, & workgroups in a convenient desktop form factor with plug'n'play compatibility with existing network environments & Microsoft Windows Storage Server 2003 operating system for easy deployment & management.

Rent* $25.80/wk
N9928 **$2,495**

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THE IOMEGA® REV™

35GB/90GB drive is a revolutionary removable hard disk system which is more efficient and reliable than traditional tape drives, while providing portable, high-performance file storage.

Automatic Backup

Norton Ghost™

- Capacity - 35GB native/ 90GB compressed capacity
- Drives - USB 2.0 and ATAPI versions available
- Fast & Efficient - Iomega REV drives allow you to back up and restore data
- Expandable & Easy - Add capacity when you need it plus no maintenance required
- Accessible - Access files in seconds with drag-and-drop
- Durable & Secure - Unlimited rewritability and password protection
- Revolutionary - Fast disaster recovery in event of system failure
- Maximum transfer rate 25MB/sec

Rent* $7.61/w

N1763 USB EXTERNAL **$679**

CDRW/DVD COMBO DRIVE FLASH CARD READER USB

- CDRW 52x Record, 24x ReWrite, 52x Read & DVD Read 16x
- Iomega CDRW/DVD ROM plus 7-in-1 Card Reader is all you need to easily transfer photos, music, and data from your flash memory to your computer & burn them to CD
- Drive includes 2 USB cables & power supply. Also includes Quick Install guide, Solutions CD with drivers & software (Iomega Hot burn Pro for PC, Charismac Discribe for MAC, Sonic Cineplayer, MusicMatch, Adobe Photoshop Album (PC) and Iomega Automatic Backup Software

N5465 **$235**

IOMEGA MICRO MINI USB 2.0 DRIVE

These tiny, light-weight USB drives fit even the smallest places.

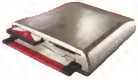
Includes:
- Micro Mini Drive
- 3 Color Caps
- Neck Chain
- Key-clip
- Extension USB illuminating cable
- Quick Install Guide

N1858 128MB **$106**

P2385 256MB **$159**

P2486 512MB **$255**

FLOPPY DISK DRIVE 1.44MB 7-IN-1 CARD READER EXT USB



Simple and easy to use, the Iome Floppy plus 7-in-1 Card Reader is the perfect choice for floppy users who take digital pictures using fla media. With the convenient front load slots and Adobe® Photoshop Album SE software included, pho and files can easily be transferred to different types of digital media. Plus, this new portable multi-form drive is now powered directly fron your computer so you can use it anywhere! Just plug the drive directly into your USB port and you're ready to go - no power cor required.

N6657 **$9**

MULTIMEDIA

HAUPPAUGE TELEVISION AND MULTIMEDIA TECHNOLOGY

AUPPAUGE MEDIA MVP

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stribute your TV
cordings, MP3 music
d Digital Camera
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etwork with the MediaMVP. Install
y Hauppauge PVR or Digital
uner card in your PC in the office
on a notebook and browse your
cordings on any TV by remote!

stration only, no other products
e with the Media MVP.

5580 **$285**

HAUPPAUGE PVR (USB2)

Personal video recorder

Watch, pause/timeshift and record your favourite television programs on your notebook (requires USB2 interface).

- Recording: MPEG/MPEG2
- Archiving: CD/DVD

K8173 **$539**

HAUPPAUGE NOVA-T (PCI) WITH REMOTE

Digital TV Tuner Card

The Nova T is a SD Digital TV PCI tuner card. Digital TV programs can be viewed live, pause/timeshifted or recorded to hard drive without any loss. These can then be archived to DVD (DVD burner required). Future HD upgradeable.

K8172 **$265**

HAUPPAUGE PVR 250 (PCI)

- Record TV to your hard disk
- Burn TV programs to VCD or DVD
- Watch TV on your desktop
- Composite and SVHS input for camcoder or foxtel input

G5990 **$409**

HAUPPAUGE DEC2000T (USB) WITH REMOTE

- SD Video output via SCART (RGB) SVideo & composite
- IR remote control included
- Operates with or without a computer
- Stereo Audio output

K8168 **$399**

HAUPPAUGE TV EXPRESS

This PCI board connects to your TV antenna or your set top box (via composite video input), to display live TV in a high quality resizable desktop window.
USB Model also available

M9423 **$99**

HAUPPAUGE WinTV RADIO

- TV on your desktop
- FM Radio
- Remote control

USB Model also available

H1477 **$199**

IDEO EDITING TOOLS

UDIO 9 SOFTWARE

e world's top-selling software
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ter!

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next generation in consumer
ftware video editors. Studio gives
u every tool you need to easily
pture video to your computer, edit
d titles, music, narration and
ecial effects and then output a
ished movie back to videotape,
D and the web.

5972 UPGRADE **$129**

6012 FULL **$234**

STUDIO AV/DV DELUXE V9

- Includes full version of Studio version 9 video editing software
- Includes PCI capture board and breakout box with analogue and digital I/O
- Capture and edit footage from your DV, Digital8 or MicroMV camcorders
- Capture and edit footage from VCR or analogue camcorders
- Get hundreds of additional 2D and 3D transitions with Pinnacle HollywoodFX Plus for Studio v.9
- Unique circuitry incorporated in Pinnacle's custom chip ensures the highest possible video image quality

M6014 **$594**

PINNACLE LIQUID EDITION UPGRADE FROM STUDIO

Pinnacle Studio users now have the opportunity to graduate to a professional video editing application. Its the same interface that's used in broadcast & post-production editing studios.

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Offer expires 30th September 2004.

P3197 UPGRADE **$399**

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DVICO FUSION HDTV LITE

P2325 **$195**

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Pioneer

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ULEAD
CREATIVE INTELLIGENCE

nero6

BUNDLED SOFTWARE

DVD MOVIEFACTORY 3.5 SE SUITE DELUXE

User-friendly DVD authoring with Dolby AC-3 audio encoder with video tutorial. Also includes Burn Now DVD/CD writing software & DVD player.

VIDEOSTUDIO 8 SE DVD

Edit & create professional video in 3 easy steps. High speed rendering & real-time performance.

DVD WORKSHOP 2 SE

Powerful & intuitive DVD authoring software with Dolby AC-3 encoder including sophisticated tools for menu creation & multiple audio tracks.

NERO OEM SUITE 3

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INTERNAL DVD/CD WRITER MULTI-FORMAT COMPATIBILITY

16 X 16

4X DOUBLE LAYER

WRITING SPEED DVD-R / DVD+R

DVR-A08XL MAIN FEATURES:

- **Industry leading speeds of 16x with DVD R and 4x with DVD+R DL:**
  The DVR-A08XL records at a high-speed 16x with DVD±R media, and 4x with double layer DVD+R media. RAM media can also be read.
  (Writing at 16x on 8x media is only possible with firmware supported verified 8x media)
- **Precision recording technology:**
  Pioneer's exclusive performance enhancing features ensure high quality recording characteristics and low operational noise.
- **Smart Laser Driver:**
  Write strategy control circuitry positioned in close proximity to the writing laser limits signal delay, allowing high quality recording at high speed.
- **Liquid Crystal Tilt / Thickness Compensator:**
  Provides accurate, reliable READ/WRITE performance with a variety of disc characteristics. The Liquid Cryst Compensator is an ideal solution for irregularly curved, thin/thick, and double layer discs.
- **Performance Adjusting Firmware:**
  Automatically adjusts between Performance mode and Quiet mode. Achieves an ideal solution by lowering disc rotation for quieter drive performance during DVD Video and Audio CD playback, while speeding up for high performance when required.

4X DVD-R/RW DVD+R/RW

DVR-A08XLA

P5656	BEIGE	$299

4X DVD-R DL

16X DVD-R DVD+R

DVR-A08XLB

P5655	BLACK	$29

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rimera's newest and most advanced CD/DVD colour inter. As a sixth-generation direct-to-disc printer, it fers a wide range of industry leading features and nefits, including:

4800 dpi print resolution
Six-colour photo mode for the most incredible, photo ealistic printing
Large ink cartridges for low cost per disc and uninterrupted printing runs

PRIMERA TECHNOLOGY, INC. Signature Z6 DVD/CD PRINTER NEW

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DPYSMARTBLAST CD AND DVD DUPLICATORS

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Burn discs fast with these new speedy stand alone duplicators
12x CD or 8x DVD
Ranging from 3 to 14 drives simultaneously burning
Built-in Hard Disk with new USB 2.0 PC connection r image management

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N2210	7 CD-R	Rent* $17.92/wk	**$1,599**
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Bravo II DISC PUBLISHER

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Professional, all-in-one CD/DVD publishing on your desktop
Totally automated and hands free
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PC and MAC versions available

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RIMAGE 2000i CD AND DVD PUBLISHERS

RIMAGE™

- Brand new sleek look CD and DVD Publishers
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- 100 disc capacity
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- Network software supports PC or MAC clients
- Plug and Play
- 2 units can be daisychained to one PC

N2212	2 CD-R	Rent* $57.20/wk	**$6,199**
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CSLCCD COPYCAT
1 to 1 Duplicator.
The cheapest and easiest way to copy CDs! No PC required.

HOT PRICE

J2058 **$299**

PRONTO DUPLICATORS

Fast, small and easy to use, Pronto works without a PC and copies up to 100 discs unattended.

L1539	1 CD-R	Rent* $16.80/wk	**$1,499**
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If you are looking for a better way to prepare your invoices, track your sales and calculate GST received, but you're not after a complete business management system, MYOB JustInvoices is just what you need.

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- Online service providers
- Subscription-based service providers
- Cash-based businesses
- And any business that needs an easy invoicing solution

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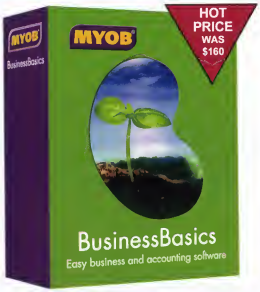

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MYOB BusinessBasics simplifies the way you quote, track and invoice your jobs, simultaneously tracking your transactions and GST, and providing you with ov 70 reports and graphs to help you understand your business.

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Centralise all your customer data into one system

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- Track Stock Assembly (finished goods)
- Units of Measure
- Sales order / back order tracking
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Welcome to the brave new world of digital photography...now what? Brian Maffitt guides you through the workflow of getting your digital photos from your camera to your computer and ultimately into your hands. You will learn about the fundamentals of taking digital pictures, loading photos onto your computer, using Adobe Photoshop to adjust your images and printing and sharing your images. This is a great way for new users to get up to speed on digital photography and modifying photos using Adobe Photoshop. Sample project files are included on the CD that enables you to work along with the same photos as the instructor.

N6038 DIGITAL PHOTOGRAPHY & PHOTOSHOP - A TOTAL TRAINING WORKFLOW GUIDE **$99**

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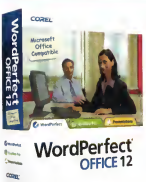

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Manage information in ACT! - then have it appear in Microsoft Outlook, Palm OS® or Pocket PC handhelds, on the Web*, or in your paper planner. That's the power of ACT! The ONE place where you can manage every detail of your customer relationship.

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- Manage your sales pipeline with forecasting tools and built-in reports.
- Share complete customer information in a workgroup environment.
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Based on the award-winning PC-cillin™, Trend Micro™ Internet Security 2004 provides you with comprehensive, easy-to-use protection from Internet threats such as viruses, hackers, privacy threats and spam email.

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- Enhanced Personal Firewall
- Integrated PDA Virus Protection
- New! Network Virus Emergency Centre
- New! Anti-spam Filtering
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- New! Spyware Detection and Removal
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L6315	SINGLE USER	**$89**
L7326	2 USER	**$115**
L7327	5 USER	**$249**

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FIGURES EXAMPLE ONLY, BASED ON PRICE OF K8903

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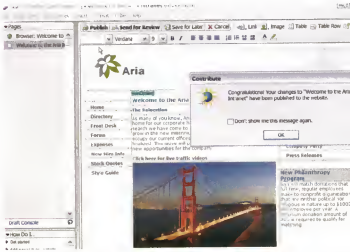
MACROMEDIA® CONTRIBUTE 3

Macromedia® Contribute 3 redefines web publishing, making it an activity open to everybody, everyday. This release meets the full spectrum of needs for business users, web professionals, and IT decision makers. As a key element of the new enterprise-ready, scalable Macromedia Web Publishing System, Contribute 3 lets everyone in an organisation publish to websites and bring them alive with up-to-date content and information. Now, corporations can communicate internally via intranets or externally through marketing websites, government agencies can publish policies an procedures to their stakeholders, and educational institutions can impleme campus-wide e-learning and academic intranets.

PUBLISH TO THE WEB IN FOUR SIMPLE STEPS:

Browse to the page that needs updating, edit it, click 'publish' and it's done. The intuitive WYSIWYG environment offers point and click simplicity, no complicated forms for simple updates.

Step 1 - Open web page
Step 2 - Edit
Step 3 - Send to review/approval (optional)
Step 4 - Publish



NEW IN VERSION 3

REVIEWS AND APPROVALS

Enable groups of users to collaborate on content. Users can send web pages to others for review before publishing li

ENHANCED ADMINISTRATION

Add users and define new, more detailed editing permissions based on roles.

DREAMWEAVER MX 2004 INTEGRATION

Include CSS, template recognition, shared check-in/check-out, rollback, page lockout, and versioning systems.

CLIENT AND SERVER EXTENSIBILITY

JavaScript and XML client extensibility layer allows wide-ranging user interface customisation while web services notifications allow server-side extensibility.

P7376	FULL	$23
P7377	UPGRADE	$12

NTRODUCING MACROMEDIA WEB PUBLISHING SYSTEM

VERYTHING AN ORGANISATION NEEDS TO AFFORDABLY BUILD, ANAGE, AND PUBLISH TO WEBSITES.

e Macromedia Web Publishing System is a scalable solution for organisations to affordably build, manage, and blish to websites. It provides a practical alternative to traditional content management systems, or complements isting systems by extending their value throughout an organisation. The Web Publishing System meets the needs web developers, IT managers, and business professionals-empowering users to publish easily to the web within entrally controlled, standards-based environment.

ILD

b developers increase productiviy building advanced, ily maintained websites.

NAGE

b and IT managers unlock the value of enterprise sites for internal and external communications.

BLISH

w business professionals become directly involved n web publishing, bringing websites alive with up to content and communications.

Web Publishing System Components

Each 10-Pack contains:

10 Contribute Business User Seats

1 Studio MX 2004 Developer Seat,
1 Contribute Developer Seat

11 Contribute Publishing Services Administrator Seats

KEY MACROMEDIA WEB PUBLISHING BENEFITS:

EASY TO USE

The Web Publishing System makes building, managing, and publishing to websites straightforward and approachable.

- Business professionals easily update and publish web content
- Web professionals design and build websites using preferred tools
- Web and IT administrators centrally manage the entire system

AFFORDABLE

The Web Publishing System is an open and affordable solution that allows web content updates to be easily distributed throughout an organisation without requiring new infrastructure. Purchase only what you need now, and then add additional licences as required.

COMPATIBLE WITH EXISTING SYSTEMS

The Web Publishing System is compatible with existing web and IT infrastructure and works cross-platform. It also extends existing content management and learning management systems.

SCALABLE AND ENTERPRISE READY

The Web Publishing System is a scalable, extensible solution for enterprises that can be easily deployed across an entire organisation. It offers comprehensive support for web and IT standards, and new server-based central management of site connections and access permissions.

ENHANCE THE VALUE OF WEBSITES

Communicate more efficiently while presenting ovnly the most up-to-date information to customers, employees, and partners. Finally business users and web professionals can work together efficiently, removing bottlenecks and bringing websites alive with content and communications

'379 STARTER 10-PACK **$3,899**

STUDIO MX 2004 WITH FLASH PROFESSIONAL

K8904 **$1,499**

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PCANYWHERE V11.0
Symantec pcAnywhere 11.0 is the world's leading remote control solution*, with integrated tools that make it easy for helpdesk and IT personnel to resolve server and workstation problems.

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*Source: 2002 IDC Worldwide Remote Control/Remote Access Software Product by Vendor by Market Share report.

NORTON ANTIVIRUS PROFESSIONAL 2004
The world's most trusted antivirus solution with advanced protection. It protects email, instant messages, and other files by removing viruses automatically. Expanded threat detection alerts you to spyware and similar hacking programs. You also get advanced tools for data recovery and secure file deletion, plus a licence for two computers.

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AREAS OF PROTECTION	Symantec AntiVirus™ 9.0	Symantec AntiVirus™ 9.0 with Groupware Protection	Symantec™ Client Security 2.0	Symantec™ Client Security 2.0 with Groupware Protection
DESKTOP/REMOTE PC				
REMOVES VIRUSES, WORMS, AND TROJAN HORSES AUTOMATICALLY	●	●	●	●
DETECTS CERTAIN NON-VIRUS THREATS SUCH AS SPYWARE	●	●	●	●
STOPS WORMS FROM SPREADING THROUGH EMAIL	●	●	●	●
PROTECTS COMPUTERS FROM HACKERS WITH A DESKTOP FIREWALL			●	●
BLOCKS INTERNET ATTACKS WITH INTRUSION DETECTION			●	●
NETWORK SERVER				
REMOVES VIRUSES, WORMS, AND TROJAN HORSES AUTOMATICALLY	●	●	●	●
DETECTS CERTAIN NON-VIRUS THREATS SUCH AS SPYWARE	●	●	●	●
INCLUDES A CENTRALISED CONSOLE TO INSTALL, UPDATE, AND RESPOND	●	●	●	●
MICROSOFT EXCHANGE/ LOTUS DOMINO SERVERS				
REMOVES VIRUSES, WORMS AND TROJAN HORSES IN EMAIL		●		●
FILTERS SPAM AND UNWANTED EMAIL CONTENT		●		●
PART	N7808	N7790	N7770	N7776
5 USER	$429	$585	$559	$769
PART	N7809	N7793	N7771	N7799
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HE LEADER IN INTERNET SECURITY

$40 CASH BACK*

SYMANTEC NORTON INTERNET SECURITY™ 2004

Symantec's Norton Internet Security™ 2004 provides essential protection from viruses, hackers, and privacy threats. Powerful yet easy to use, this award-winning suite now includes advanced spam-fighting software.

K2348 SINGLE USER	$119*

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Symantec's Norton Internet Security™ 2004 Professional protects you and your business from online threats. Its comprehensive tools defend against viruses, hackers, spam, and data loss.

K2351 SINGLE USER	$139*	K2352 5 USER	$349

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NORTON SYSTEMWORKS™ 2004 STANDARD AND PROFESSIONAL

Symantec's Norton SystemWorks 2004 is the smartest way to solve computer problems. The advanced products in this easy-to-use suite help keep your PC running at its best.
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K2354 STANDARD	$119*	K2357 PRO	$139*
K2358 5 USER PROFESSIONAL	$349		

NORTON ANTISPAM™ 2004

Symantec Norton AntiSpam™ 2004 filters unwanted email out of your inbox. Its multilevel filtering finds and flags suspicious messages, which can then be moved to your junk mail or trash folder. Norton AntiSpam™ works with any POP3 email program, but you get extra benefits with the latest versions of Microsoft® Outlook®, Microsoft Outlook Express, and Eudora®. 10 user Office packs also available.

K2363 SINGLE USER	$65	K2364 5 USER	$185

DRIVE IMAGE® V7- NOW FROM SYMANTEC

Drive Image® 7.0 Backup is a premier computer backup solution, protecting all your valuable data and providing peace of mind. Easily backup everything on your computer: priceless digital photos, important financial records, your operating system and all of your important programs and settings without ever leaving Windows®. Save valuable time by scheduling automatic backups. Quickly save your backups to virtually any writable CD or DVD drive and enjoy the flexibility of USB, FireWire® and Native Network support.

J6620 SINGLE USER	$89

NORTON PARTITIONMAGIC™ 8.0

Lets you easily organise your hard drive to store data more safely and efficiently. Easy-to-use wizards help you create separate areas for your operating system, applications, documents, music, photos, games, and backup files. Disk partitioning reduces the risk of data loss if your system crashes, and each partition works just like a separate hard drive. You can resize, copy or merge partitions whenever you need. Supports both Windows® and Linux® file systems, and is a great way to run different operating systems on the same PC.

P0286	SINGLE USER	$89
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A bundle of ScanSoft PDF Create! and PDF Converter PDF Converter Professional 2 significantly improves office productivity by providing business professionals with the ability to more seamlessly move between the two dominant electronic document formats - Microsoft Word and PDF. With PDF Converter Professional, organisations now have access to an industry-leading PDF solution that has the price, performance and features that can put the power of PDF on every business desktop.

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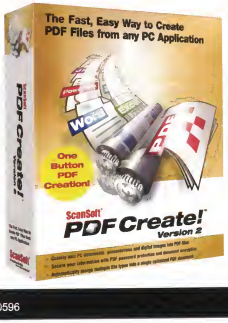
P0577 FULL **$16**



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Creating a single drawing as efficiently as possible is important. Delivering a coordinated set of drawings in a timely manner directly benefits your bottom line. With AutoCAD 2005 you can do both. Everyday tools like the table object and tool palettes boost productivity, and the new Sheet Set Manager helps you control content across entire sets of related drawings, enabling you to lower the risk for errors. Then, in a single view, you can compose and collate sheet sets and share them with your project team using plots, eTransmit, or DWF™ (Design Web Format™) files.

N0571 **$5,999**

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Quickly create tables, better manage large groups of layers, and conveniently access frequently used content to work more efficiently. Sharing your data widely is a snap: even team members without AutoCAD LT software can view and mark up your published DWF™ files, and you can instantly distribute multiple DWG files in a single step. Plus background plotting frees you to work while you print out your drawings.

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*UPGRADE FROM LT2000i/2002/2004

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AUTOSKETCH® 9

AutoSketch 9 software provides a comprehensive set of CAD tools for creating precision drawings - from electrical details to floor plans, from conceptual sketches to product specifications, and much more.
AutoSketch 9 provides: Comprehensive CAD tools for creating expert-quality drawings • Straightforward drafting in a Windows XP - like environment • Tutorials and wizards for a fast start

P7266 **$215**

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Begin designing on a computer right away with QuickCAD Release 8. Plenty of productive features let you make technical designs and diagrams, and you can start drawing the very first time you use it.

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FILEMAKER PRO 7

FILEMAKER PRO 7 IS THE EASIEST-TO-USE MOST-CUSTOMISABLE NEW VERSION OF FILEMAKER® EVER.

FileMaker Pro 7 database software is simply the fastest, easiest way to effortlessly manage people, projects, images and information. With over 100 new and improved features, FileMaker Pro 7 will help you uncover critical business information and turn your ideas into productive, creative and customised solutions.

NEW FEATURES INCLUDE:

- Visual tool for managing relationships
- Multiple views in different windows
- Store any file type in FileMaker Pro 7
- Multiple tables per file
- Improved Instant Web Publishing
- New sophisticated security model

N0476	FULL	**$460**
N0477	UPGRADE	**$229^**

^UPGRADE TODAY!
Limited time only, **ALL** customers who own a licence of FileMaker Pro 2.1, 3.0, 4.x, 5.x and 6 can upgrade to FileMaker Pro **7 until 17th September 2004.**

Visit **www.filemaker.com.au/upgrade** for more information.

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FILEMAKER LICENSING STARTER PACK

FileMaker's Licensing Starter Pack, includes four FileMaker Pro 7 licences and one licence each of FileMaker Developer 7 and FileMaker Server 7, plus 12 months upgrade maintenance. Future purchases of upgrades or new licences will be available at the discounted Volume Licence Agreeme which is normally only available with a 10-licence minimum purchase. This offer starts on July 21, 2004 and ends on December 23, 2004.

Sold individually:

N0476	**FileMaker Pro 7**	**$46**
N0478	**FileMaker Developer 7**	**$83**
N6744	**FileMaker Server 7**	**$1,69**

P7317	FULL	**$4,149**	P7318	UPGRADE	**$2,06**
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FILEMAKER SERVER 7 - UPGRADE NOW!

THERE HAS NEVER BEEN A BETTER TIME TO UPGRADE TO FILEMAKER® SERVER 7*

FileMaker Server 7 is high-performance server software that efficiently manages shared database solutions. With easy to use advances in sharin and administration, as well as enhanced security features, FileMaker Ser 7 gives you powerful features that you can use to:

- Share databases with up to 250 users
- Improve the performance of shared databases
- Host virtually unlimited amounts of data
- Administer databases locally or remotely
- Protect your data with advanced security features

*Licenced users of FileMaker Server 5.5, 5.0 or FileMaker Pro Server 3.0 2.1 can upgrade to FileMaker Server 7. This offer is valid from 25 May 2004 to 17 September 2004.

N6744	FULL	**$1,649**	N9186	UPGRADE	**$849**

FILEMAKER DEVELOPER 7 - $150 CASHBACK

FileMaker Developer 7 is an enhanced version of FileMaker Pro with integrated developer tools and utilities to help you build better databases faster. With new features, including custom functions and file maintenan tools and enhancements to the database design report, script debugger customisation options. FileMaker Developer 7 gives you power you can to:

- Streamline database development and maintenance
- Develop and troubleshoot solutions more effectively
- Deploy more customised solutions
- Create custom functions

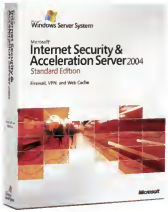
*Licensed users of FileMaker Developer 6.0 and 5.x, 4.x may purchase FileMaker Developer 7 and receive a $150 rebate. FileMaker Developer 5.x, 4.x rebates expire on 17/09/2004. Redemption via mail-in rebate to FileMaker by 01/10/2004. FileMaker Developer 6.0 rebate forms must be received by FileMaker by 31/12/2004.

N0478	FULL	**$83**

For full details on Filemaker offers visit www.filemaker.com.au/promos

Microsoft®
Internet Security & Acceleration Server 2004

IICROSOFT® ISA SERVER



Attacks against IT networks are on the rise and becoming increasingly complex. Traditional firewalls are often inadequate to protect today's Internet-connected organisations from these attacks, potentially exposing you to business and legal risks.

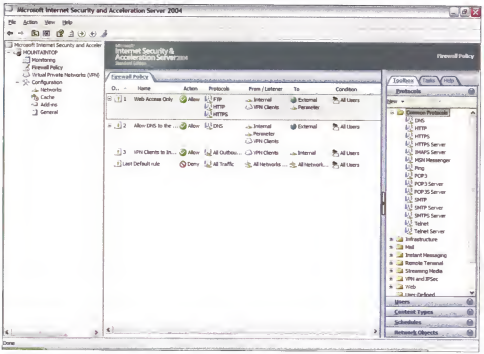
INTRODUCING MICROSOFT INTERNET SECURITY AND ACCELERATION (ISA) SERVER 2004 STANDARD EDITION (SE)

The next-generation application-layer firewall, VPN, and Web-cache solution from Microsoft that enables you to easily maximise your existing IT investments in order to improve network security and performance.
ISA Server 2004 SE is an ideal integrated solution for small- to medium-size organisations and branch offices, and is perfect for enterprises as an in-line firewall to protect key business applications.

an help you:
ecurely share information with employees, customers, and partners.
nsure your Microsoft applications such as Microsoft Exchange Server are protected and are easily accessible.
ontrol Internet access to improve employee productivity and thwart malicious attacks.
nprove the performance of your network.

W TO LICENCE ISA SERVER 2004

Server is licenced on a per-processor model. One licence is required for each processor running on the server. client access licences are required.



ADVANCED PROTECTION BUILT IN

ISA Server 2004 SE features an updated firewall architecture that has been specifically designed to combat the latest types of Internet attacks and worms. Ideally suited to protect and extend Microsoft solutions such as Exchange and Microsoft SharePoint® servers, ISA Server 2004 SE can help you control access to these resources and provide advanced multilayer security, including at the application layer.

FAST, SECURE ACCESS

ISA Server 2004 SE includes a greatly expanded array of tools and other features in order to enable secure VPN access to your network. Improved policy-based access control allows you to restrict incoming and outgoing access. And built-in Web caching optimises bandwidth usage and accelerates Web performance. ISA Server 2004 SE can also securely extend the availability of your Exchange Servers to remote users.

EASY TO USE

A member of the Microsoft Windows Server System™ family, Microsoft ISA Server 2004 SE has been designed to work seamlessly with existing Microsoft infrastructures and applications. It offers a new, simplified user interface that can make it easier for you to implement security policies and ensure proper configuration. ISA Server 2004 SE is easy to learn, leveraging your existing knowledge of Microsoft applications. ISA Server 2004 can be remotely managed, and you can keep abreast of network access and usage through detailed logging, reporting, and alerts.
To learn more about Microsoft ISA Server 2004, please visit **www.microsoft.com/isaserver**.

'7173 OPEN BUSINESS LICENCE ISA SERVER STANDARD EDITION 2004 1 PROCESSOR $2,160#

Media kit maybe required at additional cost

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Microsoft Office FrontPage 2003

MICROSOFT OFFICE FRONTPAGE 2003

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BEHAVIORS
Use behaviors to author client-side Netscape JavaScript or Microsoft JScript® without writing a single line of code.

FLASH SUPPORT
Update and enhance your site by adding Macromedia Flash content, including movies, audio-enhanced animations, and previously recorded presentations or courses.

IMAGE TRACING
Mock up an image of a Web page in a graphics program and then use it as a visual guide to create or trace the Web page design in FrontPage.

INTERACTIVE BUTTONS
Select and add professional-looking buttons to your site. Choose the font and button colour, define a link, and then set image and text settings for original, hover, and pressed states.

PAGE RULERS AND LAYOUT GRID
Precision design and placement are easy with helpful positioning guides, such as page rulers and the background layout grid.

TABLES AND CELLS LAYOUT
Create a framework for Web content using layout tables and cells. Automatically create professional graphic effects, such as rounded corners and shadows.

ASP.NET CONTROLS
Use FrontPage 2003 to preview Microsoft ASP.NET controls and work with Microsoft Visual Studio®

SPLIT VIEW
Review and modify content in a split-screen format that offers simultaneous access to Code and Design views.

TYPING AIDS
Speed up the code-writing process by using wordwrap, line numbers, automatic indentation, tag completion, bookmarks, and advanced code selection.

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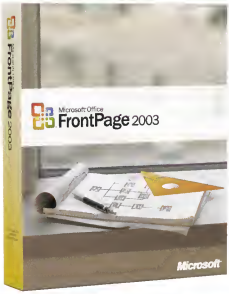
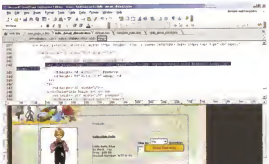
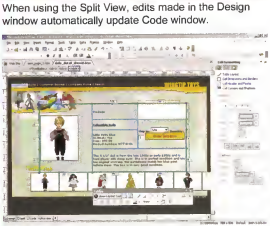




When using the Split View, edits made in the Design window automatically update Code window.



Achieve the design you want using the Cell Formatting Work Pane to manipulate columns, rows and cells.

HOW MICROSOFT FRONTPAGE 2003 HELPS YOU BUILD BETTER WEB SITES

Microsoft® Office FrontPage® 2003 is the Web site creation and management tool that gives you the features, flexibility and functionality to help you build better Web sites.

FrontPage delivers the professional design, authoring data, and publishing tools customers have asked for t create dynamic and sophisticated Web sites.

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- Improved graphics support makes it easier to work with graphics from other applications, giving you mo control over how images are displayed and saved.
- Dynamic Web Templates let you designate which sections of the site can be edited. When updating th master template file, those changes are automatica made to all pages linked to that template.
- Browser and resolution reconciliation target specific browser or screen resolutions, or see how your site will look in various combinations of browsers and resolutions.
- Layout table tools make it simple to create and manipulate tables used for layout purposes, and provide pixel-precise control of your layout.
- Layer manipulation tools make it much easier to wo with multiple images and pieces of content that all s in the same space and to create visual effects, such as pop-up menus.

CODE EFFICIENTLY, FASTER CODING TOOLS

- Split view displays edits made in the Design view automatically updated in the Code view.
- Quick Tag Selector and Quick Tag Editor helps you easily select, edit, and manipulate tags.
- Microsoft IntelliSense® technology makes writing co (HTML, CSS, XSL, JScript, and ASP.NET) easier a less prone to errors.
- Clean HTML code removes extraneous code generated by Microsoft Word or other Web authorin programs.
- Code Snippets store chunks of code and insert the into other documents from a library of code snippet

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BONUS MICROSOFT WHEEL MOUSE OPTICAL

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Virtual PC lets you create separate virtual machines on your Windows® desktop, each of which virtualises the hardware of a complete physical computer. Use virtual machines to run operating systems such as MS-DOS®, Windows, and OS/2. You can run multiple operating systems at once on a single physical computer and switch between them as easily as switching applications - instantly, with a mouse click.

Virtual PC is perfect for any scenario in which you need to support multiple operating systems, whether you use it for technical support, legacy application support, training, or just for consolidating physical computers.

For more information, go to **www.microsoft.com/virtualpc**

2856		$199

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Office Publisher 2003 is the Microsoft® Office business publishing and marketing materials program. Keeping in touch and communicating with customers is essential for any business – you can use Publisher 2003 to help you create professional marketing materials in-house, quickly and efficiently.

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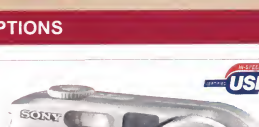

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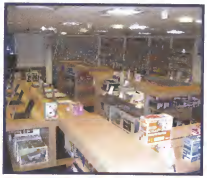

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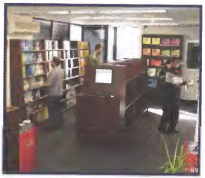

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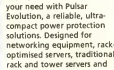

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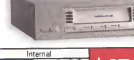

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- Compressed data transfer rate up to 25.2 GB / hour
- Compatible with MS Windows 2000, 2003, Novell NetWare 5 & 6 & Linux.
- Yosemite Technologies TapeWare XE backup software for Windows 98/Me/XP/ NT/2000/2003, NetWare 5 & 6, and Linux included

RENTSMART $18.14 PER WEEK> **$1655**
Websearch Code 223889

Certance LTO 2 Drive

Certance CL 400 LTO Ultrium 2 tape drives balance price with capacity/performance targeted at medium-to-large businesses,

- Most reliable LTO Ultrium 2 tape drive available.
- Capacity up to 400 GB per cartridge
- Enterprise class performance up to 245 GB/hr
- The most reliable Ultrium 2 tape drive available from any manufacturer
- Backward-compatible with LTO-1 tape drives from all manufacturers
- Complete solution includes Bak8one NetVault WorkGroup backup software

RENTSMART $48.85 PER WEEK> **$5359**
Websearch Code 223890

Certance LTO-2 Autoloader

The Certance AL810 autoloader delivers up to 1.6 TB of compressed data protection at transfer rates up to 115.2 GB per hour.

- External Ultra2 SCSI / LVD autoloader holds 8 cartridges in a 2U form factor.
- Up to 1.6 TB of data protection using 8 cartridges
- Compressed data transfer rate up to 1.92 GB / minute
- Supports Read While Write (RWW) and Hardware Data Compression
- FastSense variable speed technology optimizes backup time
- Autoloader support available for Windows Server, NetWare, Linux and UNIX
- Dynamic Powerdown protects cartridge and drive during a power loss
- Optional rack-mount kit and barcode reader

RENTSMART $91.77 PER WEEK> **$10748**
Websearch Code 223891

Certance Travan 40 USB

Certance TapeStor Travan USB 2.0 20/40 GB tape backup solution provides complete external data protection for notebook and desktop PC's, workstations, and Apple systems with USB connectivity. Based on Certance's award-winning TapeStor Travan products, this solution includes a 40 GB tape drive, Dantz Retrospect Express for Windows and Mac OS X operating systems, USB cable, one data cartridge and on-line User's Guide. A stand for using the drive in a vertical orientation minimizes required tabletop space.

$660
RENTSMART $7.23 PER WEEK>
Websearch Code 246837

Sony SAIT Drive

SAIT is a new tape-based data storage technology platform, that has been developed to address the ever-increasing storage needs of data intensive network environments.

- 500GB (native), 1.3TB (compressed)
- Sustained transfer rate:30 MB/s (native), 78 MB/s (compressed)
- SCSI Ultra 160
- MT8F 500,000 POH (duty 100%)
- S.25-inch full height drive mounted in external enclosure
  Assumes 2.6:1 compression with ALDC.

$16973
Websearch Code 223892

Sony AIT-3 Drive

Suitable for a PC or Mac power workstation / medium-large server. Comes complete with everything required for installation & operation assuming the machine has a SCSI Interface

- Native Capacity: 100GB (230m AIT-3 tape)
- Native Storage Speed: 12MB/s
- Interface Speed: 160MB/s synchronous
- Buffer: 1BMB
- Average Access: <27s (MIC equipped tape)
- Media Supported: 8mm 170m & 230m (no MIC standard or Remote MIC)

BONUS 10 AIT-3 Tapes

RENTSMART $44.08 PER WEEK> **$4716**
Websearch Code 223873

Sony AIT-3 Autloader

Now you can fit up to one week's backup in a compact, easy-to-use desktop device! The StorStation LI8-D81 is slightly larger than a standalone tape drive, thereby enabling simple placement on a desktop or even on top of a server. Native Capacity: 0.8TB

- Compressed Capacity: 2.0BTB
- Sustained Transfer Rate Native: 12MB/s
- Max Backup Rate: 43.2 (max) GB/h
- Max Number of Cartridges: 8
- Media Supported: AIT-1 35 GB; AIT-2 50 GB, & AIT 3 100GB

RENTSMART $66.91 PER WEEK> **$7711**
Websearch Code 223893

Fujitsu DYNADISQ 40GB

Fujitsu's New DYNADISQ is a high speed USB aluminium case for 2.5" Hard Disk Drives. Extremely compact, this state of the art aluminium storage solution is ideal for your valuable data. The USB2.0 to IDE 2.5" DYNADISQ hard drive external case is great as a mobile data solution for Laptop computers or PC's.

$228
Websearch Code 223076

Snap Appliance 1100

A portable footprint, low cost and quiet design make this an ideal server for remote offices, trade shows, sales calls or presentations.

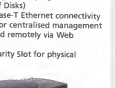
- The SnapOS Operating System
- 80GB, 160GB
- Five minute installation.
- Compact, portable easily fits in a briefcase, on a shelf or on a tabletop.
- Supports Windows, NetWare, Macintosh, Unix and Linux platforms.
- 100Base-TX/10Base-T Ethernet connectivity
- 160GB (223895) **$1518**

80GB
RENTSMART $11.47 PER WEEK> **$1046**
Websearch Code 223894

Snap Appliance 2200

Add a whisper-silent file server with RAID for a fraction of the cost of a traditional file server.

- 500GB
- Simple, award-winning user interface for ease of management
- RAID 1 (mirroring), 0 (striping) or J8OD (Just a Bunch Of Disks)
- 100Base-TX/10Base-T Ethernet connectivity
- SNMP support for centralised management (can be managed remotely via Web browser)
- Kensington Security Slot for physical security



RENTSMART $23.29 PER WEEK> **$3375**
Websearch Code 223896

Snap Appliance 4500

Industry-leading performance and capacity for departmental storage for your enterprise. No other 1U storage server matches its performance, capacity and feature set.

- Rack-optimized 1U server
- 480GB, 640GB, 720GB, 1TB
- Ideal for: File sharing, near-line storage, on-line backup, remote office server.
  Every Snap Server 4500 can support up to two Snap Disk 10 expansion arrays for easy to manage, best-in-class storage expansion.
- 640GB (223898) **$7438**
- 1TB (223900) **$9588**

480GB
RENTSMART $58.48 PER WEEK> **$6416**
Websearch Code 223897

SonicWALL TZ170 Security Platform

The SonicWALL TZ170 is a total security platform, delivering rock-solid network security, flexibility and reliability to home, small, remote and branch offices. This high performance stateful deep packet inspection firewall ships in multiple node configurations and offers a choice between absolute ease of use for basic networks and ultimate flexibility for networks with more complex needs.

$726
Websearch Code 246878

Computer Products at Rock Bottom Prices

Crumpler Roll-O-Notes

- Fits laptops with screens up to 14.1"
- Waterproof ripstop lining
- Thick protective padding
- Internal zip pockets
- Quick Flick buckle and adjustable laptop sleeve
- Comes in redlight blue, navy/oatmeal, black/grey, oatmeal/orange and olive/green

$97
Websearch Code 203872

Crumpler Wack-O-Phone

- Fits laptops with screens up to 15.1"
- Heavy duty padding and shoulder strap
- Internal and external zip pockets
- Escape hole for audio or communication devices
- Quick flick buckle and adjustable laptop sleeve
- Comes in redlight blue, navy/oatmeal, black/grey, oatmeal/orange and olive/green

$104
Websearch Code 203674

Crumpler Very Busy Man

- Fits laptops with screens up to 16"
- Waterproof ripstop lining
- Heavy duty padding and shoulder strap
- Internal zip pockets
- Quick flick buckle and adjustable laptop sleeve
- Comes in redlight blue, navy/oatmeal, black/grey, oatmeal/orange and olive/green

$112
Websearch Code 191487

IBM Computer Systems

Monitor not included. Image used for illustration purposes only.

See Page 9 for our featured monitors.

We offer specialised advice and extremely competitive prices on IBM's range of server, workstation and notebook products. Call us for a quote today!

IBM Business Partner

Series:	A30	A30	A50P
Manf:	8191LMP	8191LMQ	8423231M
Form Factor:	Desktop	Desktop	Mini Tower
Processor:	Celeron 2.4GHz	Pentium P4 2.8GHz	Pentium P4 3.0GHz
Memory (RAM):	256MB	256MB	512MB
Video:	Intel Extreme Graphics	Intel Extreme Graphics	Intel Extreme Graphics
Hard Drive:	40GB 7200RPM	40GB 7200RPM	80GB 7200RPM
Storage:	CD-ROM, Floppy	CD-ROM, Floppy	Multi-Burner
Modem/Ethernet:	Integrated Intel PRO/100 Eth.	Integrated Intel PRO/100 Eth.	Integrated Intel PRO/100 Eth.
Keyboard:	IBM Preferred Pro	IBM Preferred Pro	IBM Preferred Pro
Mouse:	IBM Wheel Mouse	IBM Wheel Mouse	IBM Wheel Mouse
Operating System:	M5 Windows XP Pro	M5 Windows XP Pro	M5 Windows XP Home
Warranty:	1 year	1 year	1 year
PRICE MAY DROP! Call or visit www.csw.com.au for best price	$994 RENTSMART $11.14 PER WEEK> Websearch Code 214449	$1241 RENTSMART $13.91 PER WEEK> Websearch Code 214450	$1668 RENTSMART $18.70 PER WEEK> Websearch Code 217291

Series:	R40e	G40	R51
Processor:	Celeron 2.2GHz	Pentium P4 3GHz	Pentium M 1.6GHz
Memory (RAM):	256MB	256MB	256MB
Video (RAM):	ATI RADEON IGP 330M	Intel Extreme Graphics	ATI Mobility RADEON 7500
Hard Drive:	30GB 4200RPM	40GB 4200RPM	40GB 4200RPM
Storage:	Combo Drive	Combo Drive	Combo Drive
Display:	14.1" XGA	15" XGA	15" XGA
Modem/Lan:	56k (V.92) / 10/100	56k (V.92) / 10/100	56k (V.92) / 10/100
Pointing Device:	TrackPoint	TrackPoint	ThinkPad UltraNav
Operating System:	M5 Windows XP Pro	M5 Windows XP Pro	M5 Windows XP Pro
Weight:	2.7kg	4.02kg	3.0kg
Dimensions:	3.89cm x 31.3cm x 25.4cm	5.09cm x 32.9cm x 28.2cm	4cm x 33.2cm x 26.9cm
Warranty:	1 year	1 year	1 year
PRICE MAY DROP! Call or visit www.csw.com.au for best price	$1713 RENTSMART $19.20 PER WEEK> Websearch Code 224436	$2447 RENTSMART $25.31 PER WEEK> Websearch Code 211158	$2575 RENTSMART $26.63 PER WEEK> Websearch Code 223439

IBM Laptops

Image used for illustration purposes only

Series:	T42	T41	R51
Processor:	Pentium M 1.5GHz	Pentium M 1.6GHz	Pentium M 1.7GHz
Memory (RAM):	256MB	512MB	512MB
Video (RAM):	32MB ATI Mobility RADEON	Mobility RADEON 7500	ATI Mobility RADEON 9000
Hard Drive:	30GB 4200RPM	40GB 4200RPM	60GB 4200RPM
Storage:	Combo Drive	Combo Drive	Combo Drive
Display:	14" XGA	14.1" XGA	15" XGA
Modem/Lan:	56k (V.92) / Gb	56k (V.92) / 10/100	56k (V.92) / 10/100
Pointing Device:	ThinkPad UltraNav	ThinkPad UltraNav	ThinkPad UltraNav
Operating System:	M5 Windows XP Pro	M5 Windows XP Pro	M5 Windows XP Pro
Weight:	2.2kg	2.2kg	3.2kg
Dimensions:	3.89cm x 31.3cm x 25.4cm	3.89cm x 31.3cm x 25.4cm	3.89cm x 33.2cm x 26.9cm
Warranty:	1 year	1 year	1 year
PRICE MAY DROP! Call or visit www.csw.com.au for best price	$2839 RENTSMART $29.13 PER WEEK> Websearch Code 226625	$3426 RENTSMART $34.00 PER WEEK> Websearch Code 211100	$3426 RENTSMART $34.00 PER WEEK> Websearch Code 223438

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as prices may change due to daily fluctuations and some discounts.

1300 658 600

VISA MasterCard American Express 5 star service RENTSMART

HP Compaq nx9110 business notebook model displayed

HP Compaq notebooks offer a choice of display sizes, multiple processor options and wireless connectivity. Designed for highly mobile professionals.

HP Compaq nc4010 business notebook model displayed

Series:	NX9110	NX9110	NC6000	NC4010
Manufacturer #:	PK362PA	D2489PA#ABG	DP894A#ABG	PH121PA
Processor:	Pentium P4 3.2GHz	Pentium P4-M 3.06GHz	Pentium M 1.6GHz	Pentium M 1.8GHz
Memory (Ram):	512MB	512MB	512MB	512MB
Hard Drive:	40GB	40GB	40GB	60GB
Storage:	DVD Rom	CD-RW/DVD Combo	CD-RW/DVD Combo	Optional
Display:	15" LCD	15.4" WXGA	14.1" LCD	12.1" LCD
Modem/LAN:	Modem/ 10/100 Ethernet	Modem/ 10/100 Ethernet	Modem/ 10/100 Ethernet	Modem/ Gigabit Ethernet
Wifi / Bluetooth:	WiFi	WiFi/Bluetooth	WiFi	WiFi/Bluetooth
Operating System:	MS Windows XP Pro	MS Windows XP Pro	MS Windows XP Pro	MS Windows XP Pro
Weight:	3.42kg	3.79kg	2.3kg	1.58kg
Dimensions:	4.24cm(H) x 36.2cm(W) x 27.85cm(D)	4.24cm(H) x 36.2cm(W) x 27.85cm(D)	3.41cm(H) x 31.76cm(W) x 26.2cm(D)	2.79cm(H) x 27.94cm(W) x 23.37cm(D)
Warranty:	1 Year parts & labour	1 Year parts & labour	3 Years parts & labour	3 Years parts & labour

PRICE MAY DROP!
Call or visit www.csw.com.au for best price

$2364	$2755	$3231	$3880
RENT FOR A YEAR $24.45 PER WEEK*	RENT FOR A YEAR $27.86 PER WEEK*	RENT FOR A YEAR $33.15 PER WEEK*	RENT FOR A YEAR $38.26 PER WEEK*
Websearch Code 246848	Websearch Code 247486	Websearch Code 211887	Websearch Code 226355

Satellite P20 model displayed with 17" TFT Wide XGA.

Toshiba offers a range of Notebooks to suit your specific needs and lifestyle. Mobile computing to suit home office users, small, medium and large corporate customers.

Toshiba Tecra A2 notebook model displayed

Series:	Tecra A2	Tecra A2	Tecra M2	Satellite P20
Manufacturers #:	PTA20A-029002	PTA20A-02C002	PTM20A-0NR6H	PSP20A-4EH8V
Processor:	Pentium M 1.5GHz	Pentium M 1.6GHz	Pentium M 1.6GHz	Pentium P4 3.06GHz
Memory (RAM):	512MB	512MB	512MB	512MB
Hard Drive:	40GB	60GB	60GB	80GB
Storage:	DVD-R/-RW	DVD Super Multi	DVD Super Multi	DVD Super Multi
Display	15" LCD	15" LCD	14" LCD	17" WXGA
Modem/LAN:	Modem/ 10/100 Ethernet	Modem/ 10/100 Ethernet	Modem/ Gigabit Ethernet	Modem/ 10/100 Ethernet
Wifi / Bluetooth	WiFi	WiFi	WiFi	WiFi
Operating System:	MS Windows XP Pro	MS Windows XP Pro	MS Windows XP Pro	MS Windows XP Pro
Weight:	2.7kg	2.7kg	2.26kg	4.5kg
Dimensions (WxDxH):	3.79cm(H) x 33.8cm(W) x 27.4cm(D)	3.79cm(H) x 33.8cm(W) x 27.4cm(D)	3.49cm(H) x 31.4cm(W) x 25.9cm(D)	4.70cm(H) x 41.9cm(W) x 29.3cm(D)
Warranty:	1 Year parts & labour	1 Year parts & labour	1 Year parts & labour	1 Year parts & labour

PRICE MAY DROP!
Call or visit www.csw.com.au for best price

$2265	$2739	$2979	$4213
RENT FOR A YEAR $23.43 PER WEEK*	RENT FOR A YEAR $28.33 PER WEEK*	RENT FOR A YEAR $30.56 PER WEEK*	RENT FOR A YEAR $41.54 PER WEEK*
Websearch Code 246424	Websearch Code 248432	Websearch Code 225005	Websearch Code 246440

*Purchase Office XP on your new PC - It's Cheaper!

Buy Office XP Pro with a new PC and SAVE approximately 55% off the RRP of full commercial versions! Call 1300 658 600 for more details on purchasing Office 2003 Edition with your new PC. (OEM versions)

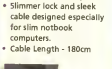
Kensington Security Notebook ComboSaver

- No keys to lose - one piece design is easy to use.
- Attaches to the built-in Kensington security slot found on 95% of all notebook computers.
- Strong, six-foot cable is an effective physical and visual deterrent to theft.
- Cable securely anchors computer to any immovable object.

$55
Websearch Code 193213

Kensington Security Notebook Microsaver Slim

- Your first line defence against slim notebook computer theft.
- Strongest lock and cable on the market.
- Patented T-bar design engages the maximum surface area possible in the Kensington security slot.
- Slimmer lock and sleek cable designed especially for slim notbook computers.
- Cable Length - 180cm



$73
Websearch Code 183581

Computer Products at Rock Bottom Prices

HP iPAQ 1910 PDA Accessories Kit

- Sync and Charge your PDA with a single cable and also in the car with the included Cigarette Lighter Adaptor.
- Protect your screen from scratches and wear
- Replace lost stylus
- Protect your PDA with a leather carry case

$75
Websearch Code 222282

Belkin Universal Slim Leather Case

For Handhelds

Your Palm, Handspring or other handheld will attach securely in place with a simple Velcro system. Fine grain leather case includes compartments for essentials like business and credit cards, ID and even a spare stylus.

$45
Websearch Code 208744

Belkin USB PDA Adaptor

Provides one DB9 Serial Port and is the most convenient way to connect your handheld to your computer. Works with Palm and other popular handheld PDAs. Completely portable. Lifetime Warranty.

$59
Websearch Code 189845

Check out our huge range of PDA accessories!

Palm Handhelds

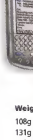
A.

B.

C.

D.

E.


F.

	Websearch	Description	Memory	Screen	Processor	OS Version	Size	Weight	Price
A.	210736	Palm Zire 21	8MB	160 x 160 Monochrome	TI (ARM) OMAP 311 126MHz	Palm OS 5.2.1	112 x 74 x 16mm	108g	$165
B.	210737	Palm Tungsten E	32MB	320 x 320 TFT	TI (ARM) OMAP 311 126MHz	Palm OS 5.2.1	115 x 78 x 12mm	131g	$329
C.	247611	Palm Zire 71	16MB	320 x 320 TFT	TI (ARM) OMAP 310 144MHz	Palm OS 5.2.1	114 x 74 x 17mm	150g	$343
D.	196168	Palm Tungsten C	64MB	320 x 320 TFT	Intel PXA255 400MHz	Palm OS 5.2.1	122 x 78 x 17mm	178g	$604
E.	210738	Palm Tungsten T3	64MB	320 x 480 TFT	Intel Xscale 400MHz	Palm OS 5.2.1	109 x 76 x 13mm	156g	$611
F.	223637	Palm Tungsten W	16MB	320 x 320 TFT	Motorola Dragonball 33MHz	Palm OS 4.1.1	122 x 78 x 16.5mm	185g	$619

With a reputation for being easy to learn & use, Palm handhelds are the most popular in the world.

Also available - Customise your handheld and add new functionality with accessories for your model.
Expansion Cards - Add software, eBooks and even databases with memory-saving MultiMediaCard or SD expansion cards.
Peripherals - Snap-on a keyboard, wireless modem or even a GPS receiver for "I-didn't-know-I-could-do-that" transformations.
Cases & Covers - Express yourself with black leather, tough aluminium, or whatever suits you.

HP iPAQ Pocket PCs

A.

B.

C.

D.

E.

F.

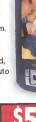
	Websearch	Description	Memory	Screen	Processor	OS Version	Size	Weight	Price
A.	248456	HP iPAQ RZ1710	32MB	240 x 320 TFT	Samsung 53C2410	Win Mobile 2003 SE	114 x 70 x 13.4 mm	120g	$471
B.	248605	HP iPAQ RX3417	88MB	240 x 320 TFT	Samsung 53C 2440	Win Mobile 2003 SE	114.3 x 71.2 x 16.3 mm	147.4g	$664
C.	248530	HP iPAQ RX3715	152MB	240 x 320 TFT	Samsung 53C 2440	Win Mobile 2003 SE	114.3 x 71.2 x 16.3 mm	158.1g	$761
D.	209078	HP iPAQ H1930	64MB	240 x 320 TFT	Samsung (2410) 203MHz	Win PocketPC 2003 Pro	113 x 70 x 13mm	124g	$375
E.	207331	HP iPAQ H2210	64MB	240 x 320 TFT	400MHz Intel XScale tech.	Win PocketPC 2003 Prem	115 x 15 x 76mm	144g	$567
F.	207332	HP iPAQ H5550	128MB	240 x 320 TFT	400MHz Intel XScale tech.	Win PocketPC 2003 Prem	138 x 84 x 16mm	207g	$1119

iPAQ Pocket PCs provide full PDA functionality with color displays and integrated connectivity options

Whether you're a technophile dreaming of a wirelessly connected life or a busy professional looking for a comprehensive business solution, there's an HP iPAQ Pocket PC to suit your needs and budget. The HP iPAQ Pocket PC features a broad range of wireless capabilities including integrated BluetoothTM technology and, in select models, wireless connectivity through WLAN cards. This means you can stay connected no matter where you are. The removable and rechargeable battery keeps you powered up when you're on the move and the Universal Remote function provides you with complete control of your home entertainment system. The HP iPAQ Pocket PC – it will change the way you live, work and play, forever.

Toshiba e400 Pocket PC

Pocket PC 2003 operating system, Intel Xscale PXA-261 at 300MHz processor, colour screen, 64MB RAM system memory plus 32MB (NAND) ROM memory plus 16MB operating system memory, Secure Digital (SD) slot, Infrared Port, built-in speaker and microphone, MP3 and Windows Media. Dimensions: 77x125x10.15mm. Additional software applications: Text-to-Speech, World Clock, Voice Command, Clear Vue, Voice recorder, Auto Backup.



RENTSMART $6.11 PER WEEK*
Websearch Code 212526
$557

Toshiba e800 Pocket PC

Pocket PC 2003 operating system, Intel Xscale PXA-263 at 400MHz processor, colour display, (480x640 resolution), 128MB RAM system memory plus 32MB (NAND) ROM memory plus 32MB operating system memory, voice record button, integrated Bluetooth or integrated Wi-Fi (IEEE 802.11b), SD/CF card slot, infrared port. Dimensions: 77x135x16.7mm. Bluetooth.

- Wi-Fi (212528) $1172

RENTSMART $12.27 PER WEEK*
Websearch Code 213011
$1119

O2 XDA II Pocket PC & GSM Phone

Features: 400MHz Intel Xscale PXA263 processor, 128MB SDRAM, 64MB ROM, 3.5" transflective 65,536 colour LCD (240 x 320 pixels), MMC & SD/IO slot, Infrared Port, Bluetooth, IM/SMS/MMS, full internet browsing, VGA camera (640 x 480 pixels), MPEG camcoder, MP3 media player, speakerphone and voice recorder facility, handwriting recognition, Windows Mobile 2003 for Pocket PC. Size: 70x130x19mm, 190 grams.

RENTSMART $13.86 PER WEEK*
Websearch Code 223575
$1209

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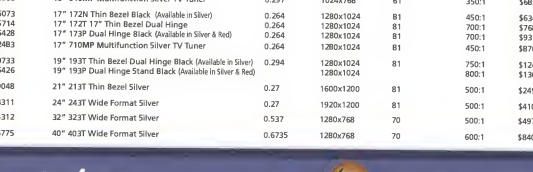
Philips CRT Monitors

Websearch	Product Description	Dot Pitch	Max. Res	Hor.Scan.Freq	Refresh	Price
222758	17" 107E Beige (Available in Black)	0.27mm	1280x1024	85	70KHz	$164
246683	17" 107561/75 Real Flat Beige	0.25mm	1280 x 1024	85	71Khz	$180
212643	19" 109B Flat Beige (Available In Black)	0.25mm	1920x1440	85	97KHz	$347
247273	19" 109B CRT Black	0.25mm	1920 x 1440	85	111Khz	$521
195386	21" 201B Beige	0.25mm	1920x1440	85	115KHz	$737
195387	22" 202P Flat Beige	0.24mm	2048x1536	85	130KHz	$1055

Philips LCD Monitors

Websearch	Product Description	Pixel Pitch	Max. Res	Hor.Scan.Freq	Contrast	Price
223130	15" 150B5CB Black (Available in Silver)	0.297	1024x768	75	450:1	$558
223131	17" 170S5FG Beige (Available in Black and Silver)	0.264	1280x1024	75	450:1	$614
223056	19" 190S5CB Black (Available In Silver)	0.294	1280x1024	75	500:1	$993
222022	19" 190P5ES Black (Built In Speakers)	0.294	1280x1024/	75	700:1	$1159
211451	20" 200P4VG Beige Black (Built In Speakers)	0.255	1600x1280	75	400:1	$2319
222023	23" 230W5V5 (Wide Screen)	0.258	1920x1200	85	500:1	$3015
222025	30" 300WN5Q5 Silver (Available in Black)	0.5025	1280x768	60	500:1	$4471

Samsung LCD Monitors



Websearch	Product Description	Pixel Pitch	Max. Res	Hor.Scan.Freq	Contrast	Price
223573	15" 153V Ivory (Available In Silver)	0.297	1024x768	61	350:1	$497
210727	15" 152N Thin Bezel Black (Available in Silver)	0.297	1024x768	61	350:1	$571
195703	15" 152T Multimedia Silver	0.297	1024x768	61	600:1	$622
226106	15" 152SM Multimedia Dual Hinge Silver	0.297	1024x768	61	350:1	$614
214308	15" 510MP Multifunction Silver TV Tuner	0.297	1024x768	61	350:1	$685
225073	17" 172N Thin Bezel Black (Available in Silver)	0.264	1280x1024	81	450:1	$634
195714	17" 172T 17" Thin Bezel Dual Hinge	0.264	1280x1024	81	700:1	$768
225428	17" 173P Dual Hinge Black (Available in Silver & Red)	0.264	1280x1024	81	700:1	$931
222483	17" 710MP Multifunction Silver TV Tuner	0.264	1280x1024	81	450:1	$870
210733	19" 193T Thin Bezel Dual Hinge Black (Available in Silver)	0.294	1280x1024	81	750:1	$1247
225426	19" 193P Dual Hinge Stand Black (Available In Silver & Red)		1280x1024		800:1	$1369
209048	21" 213T Thin Bezel Silver	0.27	1600x1200	81	500:1	$2494
214311	24" 243T Wide Format Silver	0.27	1920x1200	81	500:1	$4105
214312	32" 323T Wide Format Silver	0.537	1280x768	70	500:1	$4976
206775	40" 403T Wide Format Silver	0.6735	1280x768	70	600:1	$8400

Kensington FlyLight Notebook USB Light

- No batteries; plugs into any USB port
- Bulb-free LED design never wears out
- Uses less than 90 seconds per hour of battery charge
- Sleek hi-tech design is a perfect accessory for busy travellers
- Flexible neck stays where you put it

$19
Websearch Code 224320

Kensington Pocket Keypad Calculator

All-in-one design: numeric keypad and fully functional office calculator in one. Makes number entry on any laptop fast, simple and easy. Detachable USB cable retracts into a small compartment for neat and easy storage.

Pocket Keypad Calculator
$49
Websearch Code 223142

Kensington Notebook Telephone Cord

Stay connected on the road with the pocket-sized Kensington Portable Modem Cord! With it eight feet of cord makes it easy to reach that available phone port! A high-quality, one-touch retraction mechanism, keeps everything nice and neat.

- Kensington Portable Ethernet Cord (223144) $29

Notebook Telephone Cord
$16
Websearch Code 223140

Computer Products at Rock Bottom Prices

Telstra F2100 DECT Cordless Telephone

- Digital Enhanced Cordless Telephone (DECT) provides digital voice clarity and security.
- Telstra call number display.
- 10 number memory.
- Shows last 10 numbers dialed.
- 13 hours talk time or 12 days standby.
- **With additional handset** (19517B) $115

$66
Webcsearch Code 195177

Telstra F2150 DECT Cordless Telephone

- Digital Enhanced Cordless Telephone (DECT) with integrated answering machine.
- Shows last 10 callers
- 10 number memory
- Fully digital answering machine with 12 minutes recording time
- Time & date stamping of all incoming messages
- **With additional handset** (207278) $156

$107
Webcsearch Code 207277

Telstra F3000 DECT Cordless Telephone

- Digital Enhanced colour screen Cordless Telephone (DECT) provides digital voice clarity and security
- SIM card reader
- Large 4096 colour display
- 200 name & number phone-book
- Calling number display
- 2 games included

$165
Webcsearch Code 211915

Epson EPL-6200N

- 1200 x 1200 dpi
- 20ppm black
- 8MB RAM
- 250 sheet tray
- Parallel/USB
- Ethernet ready
- Win/Mac
- EPL-6200 RentSmart $7.09 (211807) $647

RENTSMART $9.53 PER WEEK> **$841**
Webcsearch Code 218423

Epson Colour C900N

- 600 x 600dpi
- 16ppm black, 4ppm colour
- 64MB RAM
- 200 sheet multi-purpose tray
- Ethernet ready
- Win/Mac
- Epson C900 RentSmart $9.51 (196840) $868

C900N
RENTSMART $12.63 PER WEEK> **$1127**
Webcsearch Code 200445

Epson Colour AL-C1900

- 600 x 600 dpi
- 16ppm black
- 4ppm colour
- 96MB RAM
- 200 sheet tray
- Parallel/USB
- Ethernet ready
- Win/Mac

RENTSMART $11.85 PER WEEK> **$1057**
Webcsearch Code 196841

HP Colour LaserJet 2550N

- 600 x 600dpi
- 12ppm black, 4ppm colour
- 64MB RAM
- Up to 875 sheet input
- Ethernet ready
- Win/Mac

RENTSMART $15.87 PER WEEK> **$1416**
Webcsearch Code 226005

HP Colour LaserJet 3500N

- 600 x 600dpi
- 12ppm black & colour
- 64MB RAM
- Up to 350 sheet input
- USB 2.0
- Ethernet ready
- Win/Mac
- HP 3500 RentSmart $18.73 (212690) $1709

RENTSMART $22.13 PER WEEK> **$1974**
Webcsearch Code 212689

HP Colour LaserJet 3700

- 600 x 600dpi
- 16ppm black & colour
- 64MB RAM
- Up to 350 sheet input
- USB & parallel
- Win/Mac
- **HP 3700DN** RentSmart $35.72 (212692) $3642

RENTSMART $25.80 PER WEEK> **$2494**
Webcsearch Code 212691

HP LaserJet 1015

- 600 x 600 dpi
- 14ppm black
- 16MB RAM
- 150 sheet tray
- Parallel/USB
- Win/Mac
- HP 1010 (209726) $292

1015
Webcsearch Code 209727 **$370**

HP LaserJet 1300

- 1200 x 1200dpi
- 20ppm black
- 16MB RAM
- 250 sheet tray
- Parallel/USB
- Win/Mac

1300N
RENTSMART $7.50 PER WEEK> **$685**
Webcsearch Code 196460

HP LaserJet 2300N

- 1200 x 1200dpi
- 25ppm black
- 48MB RAM
- 350 sheet input
- Parallel/USB
- Ethernet ready
- Win/Mac

2300N
RENTSMART $20.05 PER WEEK> **$1789**
Webcsearch Code 196363

HP LaserJet 4200N

- 1200 x 1200dpi
- 35ppm black
- 48MB RAM
- 600 sheet input
- Parallel
- Ethernet ready
- Win/Mac
- **HP 4200DTN** RentSmart $32.47 (195314) $3311

4200N
RENTSMART $25.95 PER WEEK> **$2509**
Webcsearch Code 198185

HP LaserJet 4300N

- 1200 x 1200 dpi
- 43ppm black
- 80mb RAM
- 600 sheet input
- Ethernet ready
- Win/Mac
- **HP 4300TN** RentSmart $35.16 (206300) $3543

RENTSMART $31.95 PER WEEK> **$3114**
Webcsearch Code 196364

HP Colour LaserJet 5500DN

- 600 x 600 dpi
- 21ppm black & colour
- 96MB RAM
- 600 sheet input
- A3 printing capacity
- Win

RENTSMART $73.12 PER WEEK> **$8215**
Webcsearch Code 223705

CAN THE DEAL GET GETTER?
Call 1300 300 003 or visit www.oneh.com.au as prices may change due to daily fluctuations and online discounts.

1300 658 600

VISA MasterCard RENTSMART

Lexmark Laser Printer E232

- 600 X 600dpi
- 21ppm black
- 16MB Ram
- 250 sheet tray
- Parallel & USB 2.0
- Win/Mac

Websearch Code 225429 **$419**

Lexmark Laser Printer E332N

- 1200 X 1200dpi
- 26ppm black
- 32MB Ram
- 250 sheet tray
- Parallel & USB 2.0
- Win/Mac

RENT SMART $10.45 PER WEEK> Websearch Code 225409 **$932**

Lexmark Laser Printer T630N

- 1200 x 1200dpi
- 35ppm black
- 64MB Ram
- Up to 350 sheet input
- USB
- Win/Mac
- Ethernet Ready

T360N RENT SMART $18.03 PER WEEK> Websearch Code 207468 **$1645**

Nokia 7200

- Style pack that includes coordinated covers, soft pouch and wrist strap
- Integrated handsfree speaker
- Integrated digital camera
- Alarm clock, Calendar & Calculator
- SMS, MMS, & Chat messaging
- Voice clips
- FM stereo radio, Games & Polyphonic ringtones

$792

Websearch Code 224287

Lexmark Laser Printer T632N

- 1200 X 1200dpi
- 38ppm black
- 64MB Ram
- 600 sheet input
- USB 2.0
- Ethernet Ready
- Win/Mac

RENT SMART $24.98 PER WEEK> Websearch Code 207470 **$2415**

Lexmark Colour Laser Printer C510N

- 1200 x 1200dpi
- 30ppm black, 8ppm
- 64 MB Ram
- 250 sheet input
- USB
- Win/Mac
- Ethernet Ready
- C510DN RentSmart $33.76 (223789) $3442

C510N RENT SMART $22.98 PER WEEK> Websearch Code 223788 **$2096**

Lexmark Colour Laser Printer C752N

- 1200 x 1200dpi
- 19ppm black and colour
- 128 MB Ram
- 600 sheet input
- USB
- Win/Mac
- Ethernet Ready
- C752DN RentSmart $41.58 (222885) $4449

C752N RENT SMART $34.40 PER WEEK> Websearch Code 223830 **$3507**

Nokia 5140

- Integrated handsfree speaker
- Tri-band world phone
- Voice dialling, Commands & Record
- Alarm Clock, Calendar, Calculator & Digital Compass
- Integrated Digital Camera
- SMS, MMS, & chat messaging
- FM stereo radio
- Games
- Polyphonic Ringtones

$561

Websearch Code 225434

Oki Laser Printer B4300N

- 1200 X 600dpi
- 18ppm black
- 16MB Ram
- 250 sheet input
- Parallel & USB 2.0
- Ethernet Ready
- Win/Mac

RENT SMART $8.99 PER WEEK> Websearch Code 203375 **$802**

Oki Colour Laser Printer C3100

- 1200 x 600dpi
- 20ppm black & 12ppm colour
- 32MB Ram
- 300 sheet input
- USB 2.0
- Win/Mac

RENT SMART $10.44 PER WEEK> Websearch Code 224667 **$931**

Oki Colour Laser Printer C5200N

- 1200 x 600dpi
- 24ppm black & 16ppm colour
- 32MB Ram
- 300 sheet input
- USB 2.0
- Ethernet Ready
- Win/Mac

RENT SMART $13.56 PER WEEK> Websearch Code 224668 **$1210**

Nokia 6220

- Integrated handsfree speaker
- Voice dialling, Commands & Recorder
- Phonebook: Contacts with images
- Conference Call, Calendar & Alarm Clock
- Integrated Digital Camera
- Predictive text input, SMS, MMS, Picture messaging, & Email client massaging

$521

Websearch Code 217388

Oki Colour Laser Printer C5400N

- 1200 x 600dpi
- 24ppm black & 16ppm colour
- 64MB Ram
- 300 sheet input
- USB 2.0
- Ethernet Ready
- Win/Mac

RENT SMART $23.79 PER WEEK> Websearch Code 224669 **$2122**

Oki Colour Laser Printer C7300

- 1200 x 600dpi
- 24ppm black & 20ppm colour
- 64MB Ram
- 630 sheet input
- Parallel & USB 1.1
- Win/Mac

RENT SMART $36.91 PER WEEK> Websearch Code 203441 **$3719**

Oki Colour Laser Printer C7500N

- 1200 x 1200dpi
- 24ppm black & 20ppm colour
- 128MB Ram
- 630 sheet input
- Parallel & USB 1.1
- Ethernet Ready
- Win/Mac

RENT SMART $48.12 PER WEEK> Websearch Code 203455 **$5214**

Belkin Cable IEEE

Belkin Cable IEEE 1394

- 4 Pin to 4 90cmm (190902) $15
- 4 Pin to 4 1.8m (190898) $25
- 6 Pin to 4 90cm (190533) $16
- 6 Pin to 4 1.8m (190809) $25
- 6 Pin to 6 1.8m (190897) $25

Belkin Cable Firewire 800/400 9pin-4pin

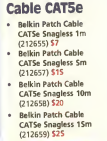
- 1.8m (223847) $23

Belkin Cable Firewire 800/400 9pin-6pin

- 1.8m (223848) $23
- 4.5m (223849) $26

Belkin Cable Firewire 800/400 9pin-9pin

- 1.8m (223851) $23
- 4.5m (223852) $26



Belkin Patch Cable CAT5e

- Belkin Patch Cable CAT5e Snagless 1m (212655) $7
- Belkin Patch Cable CAT5e Snagless 5m (212657) $15
- Belkin Patch Cable CAT5e Snagless 10m (212658) $20
- Belkin Patch Cable CAT5e Snagless 15m (212659) $25

We Stock CAT6 Cables

Belkin USB Peripheral Cables

- Belkin USB Peripheral Cable A-B 1.8m (BEL148) $12
- Belkin USB Peripheral Cable A-B 3m (BEL149) $17
- Belkin USB Peripheral Cable A-B 5m (190572) $22

Canon Inkjet printers

A.

B.

C.

D.

E.

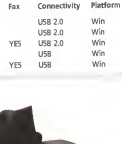
	Webcode	Product Description	Black	Colour	Print Resolution	Connectivity	Platform	Price
A.	209228	Canon s200SPx Inkjet Printer	5ppm	3ppm	2880 x 720	USB	Win / Mac	$73
B.	208753	Canon i350 Inkjet Printer	16ppm	11ppm	4800 x 1200	USB	Win / Mac	$129
C.	211986	Canon i475D Inkjet Printer*	18ppm	12ppm	4800 x 1200	USB	Win / Mac	$249
D.	209573	Canon i560 Inkjet Printer	22ppm	15ppm	4800 x 1200	Parallel / USB	Win / Mac	$229
E.	224431	Canon i965 Inkjet Printer	10ppm	10ppm	4800 x 2400	USB 2.0 / 1.1	Win / Mac	$495
F.	196658	Canon i6100 (A3) Inkjet Printer	12ppm	9ppm	2400 x 1200	Parallel / USB	Win / Mac	$539

Canon Multifunction printers

A.

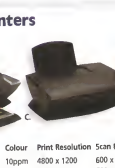
B.

C.

D.

E.

	Webcode	Product Description	Black	Colour	Print Resolution	Scan Resolution	Copy-Black	Fax	Connectivity	Platform	Price
A.	211989	Canon MP360 MFC Printer	18ppm	12ppm	4800 x 1200	1200 x 2400	18ppm		USB 2.0	Win	$265
B.	211990	Canon MP370 MFC Printer*	18ppm	12ppm	4800 x 1200	1200 x 2400	18ppm		USB 2.0	Win	$309
C.	225444	Canon MP390 MFC Printer	18ppm	12ppm	4800 x 1200	1200 x 2400	18ppm	YES	USB 2.0	Win	$399
D.	196661	Canon MP700 MFC Printer*	22ppm	14ppm	4800 x 1200	1200 x 2400	22ppm		USB	Win	$419
E.	197558	Canon MP730 MFC Printer	22ppm	14ppm	4800 x 1200	1200 x 2400	22ppm	YES	USB	Win	$529

Lexmark Inkjet printers

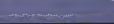
A.

B.

C.

	Webcode	Product Description	Black	Colour	Print Resolution	Connectivity	Platform	Price
A.	224301	Lexmark Z513 Inkjet Printer	12ppm	7ppm	2400 x 1200	USB 2.0 / 1.1	Win	$53
B.	247481	Lexmark Z515 Inkjet Printer	12ppm	7ppm	4800 x 1200	USB 2.0 / 1.1	Win	$71
C.	224284	Lexmark Z615 Inkjet Printer	14ppm	8ppm	4800 x 1200	USB 2.0 / 1.1	Win / Mac	$78

Lexmark MultiFunction printers

A.

B.

C.

D.

E.

	Webcode	Product Description	Black	Colour	Print Resolution	Scan Resolution	Copy-Black	Fax	Connectivity	Platform	Price
A.	211102	Lexmark P3150 MFC Inkjet Printer*	17ppm	10ppm	4800 x 1200	600 x 1200	13ppm		USB 2.0	Win / Mac	$157
B.	224283	Lexmark X1185 MFC Inkjet Printer	14ppm	8ppm	4800 x 1200	600 x 1200	13ppm		USB 2.0	Win / Mac	$134
C.	224282	Lexmark X2250 MFC Inkjet Printer	14ppm	8ppm	4800 x 1200	600 x 1200	13ppm		USB 2.0	Win / Mac	$158
D.	225108	Lexmark X4270 MFC Inkjet Printer	19ppm	10ppm	4800 x 1200	600 x 1200	18ppm	YES	USB 2.0	Win / Mac	$197
E.	224399	Lexmark X5250 MFC Inkjet Printer	20ppm	14ppm	4800 x 1200	600 x 1200	15ppm		USB 2.0	Win / Mac	$213
F.	211187	Lexmark X6150 MFC Inkjet Printer	19ppm	15ppm	4800 x 1200	600 x 1200	16ppm	YES	USB 2.0	Win / Mac	$313
G.	207053	Lexmark X6170 MFC Inkjet Printer	19ppm	15ppm	4800 x 1200	600 x 1200	16ppm	YES	USB 2.0	Win / Mac	$319

*Media card compatible

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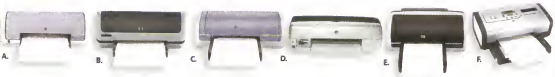
HP Inkjet Printers



Webcode	Product Description	Black	Colour	Resolution	Connectivity	Platform	Price
A. 197427	HP Deskjet 3550 Inkjet Printer	14ppm	10ppm	2400 x 1200 dpi	USB	Win/Mac	$86
B. 207744	HP Deskjet 3650 Inkjet Printer	17ppm	12ppm	Up to 4800 dpi	USB	Win/Mac	$129
C. 208633	HP Deskjet 5160 Inkjet Printer	19ppm	14ppm	Up to 4800 dpi	USB	Win/Mac	$172
D. 210213	HP Photosmart 7260 Inkjet Printer*	16ppm	12ppm	Up to 4800 dpi	USB	Win/Mac	$172
E. 207745	HP Deskjet 5652 Inkjet Printer	21ppm	15ppm	Up to 4800 dpi	USB/Parallel	Win/Mac	$258
F. 210214	HP Photosmart 7660 Inkjet Printer*	12ppm	11ppm	4800 x 1200 dpi	USB	Win/Mac	$259

HP Multifunction Printers

Webcode	Product Description	Black	Colour	Copy-Black	Print Res.	Scan Res.	Fax	Connectivity	Platform	Price
A. 210591	Multifunction OfficeJet PSC1210	12ppm	10ppm	12ppm	4800 x 1200	600 x 600 dpi		USB	Win / Mac	$147
B. 211676	Multifunction OfficeJet PSC1350*	17ppm	12ppm	17ppm	4800 x 1200	600 x 600 dpi		USB	Win / Mac	$211
C. 224046	Multifunction OfficeJet PSC2310*	21ppm	14ppm	21ppm	4800 x 1200	1200 x 600 dpi		USB	Win / Mac	$336
D. 223642	Multifunction OfficeJet PSC2410*	21ppm	15ppm	21ppm	4800 x 1200	1200 x 2400 dpi	YES	USB	Win / Mac	$43
E. 194905	Multifunction OfficeJet 6110	19ppm	15ppm	19ppm	4800 x 1200	1200 x 2400 dpi	YES	USB	Win / Mac	$516
F. 197333	Multifunction OfficeJet 7130*	22ppm	18ppm	22ppm	4800 x 1200	1200 x 4800 dpi	YES	USB	Win / Mac	$736

Epson Inkjet Printers

Webcode	Description	Black	Colour	Resolution	Connectivity	Platform	Price
A. 200432	Epson Stylus C43UX Inkjet Printer	12ppm	5.4ppm	Up to 2880 dpi	USB	Win/Mac	$85
B. 200433	Epson Stylus C43SX Inkjet Printer	12ppm	5.4ppm	Up to 2880 dpi	USB/Parallel	Win	$104
C. 211329	Epson Stylus C63 Inkjet Printer	17ppm	14ppm	5760 x 1440 dpi	USB/Parallel	Win/Mac	$152
D. 221900	Epson Stylus Photo R210 Inkjet Printer	15ppm	15ppm	5760x1440 dpi	USB	Win/Mac	$212
E. 212235	Epson Stylus C83 Inkjet Printer	22ppm	12ppm	5760 x 1440 dpi	USB/Parallel	Win/Mac	$256
F. 214621	Epson Stylus Photo R310 Inkjet Printer	15ppm	15ppm	5760x1440 dpi	USB	Win/Mac	$339

Epson Multifunction Printers

Webcode	Description	Black	Colour	Print Resolution	Scan Resolution	Copy-Black	Connectivity	Platform	Price
A. 196271	Multifunction Stylus CX3100	14ppm	14ppm	10ppm	5760 x 720	600 x 1200	USB	Win / Mac	$210
B. 211183	Multifunction Stylus CX6500*	22ppm	11ppm	16ppm	5760 x 1440	1200 x 2400 dpi	USB	Win / Mac	$343
C. 212404	Multifunction Stylus Photo RX510*	17ppm	16ppm	10ppm	5760 x 1440	2400 x 4800 dpi	USB	Win / Mac	$506

*Media card compatible

HP Papers

- A4 Everyday Photo Semi Gloss 170gsm
  100 Sheets (224383) $17
- A4 Premium Inkjet 98gsm
  200 Sheets (192820) $33
- A4 Everyday Paper 44gsm
  1 Ream (208028) $8

Canon Papers

- A4 High Resolution 110gsm
  50 Sheets (192789) $13
  200 Sheets (194579) $33
- A3 High Resolution 110gsm
  20 Sheets (196358) $10
  100 Sheets (196198) $42

Kodak Papers

- 4" x 6" Picture Paper
  20 Sheets (195432) $10
  40 Sheets (212721) $15
- 4" x 6" Premium Picture Paper
  25 Sheets (208417) $16
  75 Sheets (208414) $32
- A4 Everyday Picture Paper 165gsm
  20 Sheets (195444) $10
  100 Sheets (208412) $35
- A4 Picture Paper Glossy 190gsm
  25 Sheets (195434) $15
  75 Sheets (202113) $33
- A4 Premium Picture Paper Glossy 220gsm
  15 Sheets (189563) $15
  50 Sheets (189631) $33
- A4 Premium Picture Paper Satin 220gsm
  15 Sheets (189301) $15
  50 Sheets (195442) $33

Epson Papers

- Photo Quality Inkjet Paper
  100 Sheets
  A4 (EPS451) $27
  A3 (196187) $64
  A3+ (194822) $79
- Matte Heavyweight Paper
  50 Sheets
  A4 (EPS454) $27
  A3 (189993) $65
  A3+ (200355) $81
- Photo Glossy Paper
  20 Sheets
  A4 (190757) $20
  A3 (EPS455) $68
  A2 (196329) $105
- Premium Photo Glossy Paper
  50 Sheets 4" x 6" (211436) $14
  20 Sheets A4 (EPS001) $32
  A3 (EPS416) $78
  A3+ (200410) $115

Altec Lansing 220 Speaker

This two-piece system works well for music and gaming.

- 10 Watts of total system power
- Quality stereo
- Built-in controls
- Headphone jack
- Total connectivity
- Distinctive, all-decor styling
- Easy set-up

$49
Websearch Code 190463

Altec Lansing 221 Speaker

This 3-piece system is a sturdy system for music and gaming that fits on your desktop and within your budget.

- 50 Watts of Total System Power
- 25 Watts RMS
- Compact Subwoofer
- Built-In Controls
- Headphone Jack
- Quality Stereo
- Distinctive, All-Decor Styling
- Color-Coded Cables

$79
Websearch Code 224188

Altec Lansing 2100 Speaker

With a unique, futuristic look and the 2100 a terrific 3-piece PC speaker system.

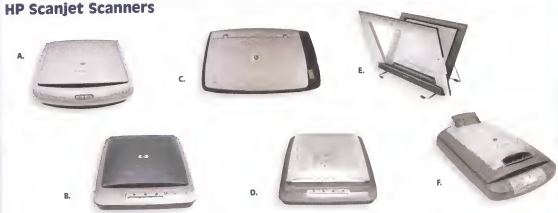
- 50 Watts
- High Performance Micro Drivers
- Ported, Dual Subwoofer Drivers
- Digital Controller
- Cast Alloy Stands

$130
Websearch Code 222757

Canon CanoScan Scanners

	Websearch	Product Description	Resolution	Connectivity	Platform	Price
A.	195888	Canon CanoScan LiDE 20 Scanner	600 x 1200 dpi	USB	Win/Mac	$89
B.	195876	Canon CanoScan LiDE 30 Scanner	1200 x 2400 dpi	USB2	Win/Mac	$139
C.	211992	Canon CanoScan CS3200F Scanner with Transparency Adaptor	1200 x 2400 dpi	USB	Win/Mac	$229
D.	209576	Canon CanoScan LiDE 80 Scanner with Transparency Adaptor	2400 x 4800 dpi	USB2	Win/Mac	$269
E.	224186	Canon CanoScan CS200F Scanner with Transparency Adaptor	2400 x 4800 dpi	USB2	Win/Mac	$319
F.	195879	Canon CanoScan 9900F Scanner with Transparency Adaptor	3200 x 6400 dpi	USB2 / Firewire	Win/Mac	$619

HP Scanjet Scanners



	Websearch	Product Description	Resolution	Connectivity	Platform	Price
A.	208636	HP Scanjet 2400c Scanner	1200 x 1200 dpi	USB	Win/Mac	$129
B.	208637	HP Scanjet 3670c Scanner with Transparency Adaptor	1200 x 1200 dpi	USB	Win/Mac	$215
C.	196263	HP Photosmart 1200 Photo Scanner **(Portable)**	1200 x 1200 dpi	USB	Win/Mac	$215
D.	208635	HP Scanjet 3970c Scanner with Transparency Adaptor	2400 x 2400 dpi	USB	Win/Mac	$344
E.	212025	HP Scanjet 4670 Scanner	2400 x 2400 dpi	USB	Win/Mac	$430
F.	211910	HP Scanjet 5530 Photosmart Scanner with Transparency Adaptor	2400 x 4800 dpi	USB	Win/Mac	$516

Epson Perfection/Expression Scanners

	Websearch	Product Description	Resolution	Connectivity	Platform	Price
A.	208228	Epson Perfection 1670 Photo Scanner with Transparency Adaptor	1600 x 3200 dpi	USB	Win/Mac	$254
B.	209805	Epson Pefefection 3170 Photo Scanner with Transparency Adaptor	3200 x 6400 dpi	USB2	Win/Mac	$552
C.	212994	Epson Perfection 4870 Photo Scanner with Transparency Adaptor	4800 x 9600 dpi	USB / Firewire	Win/Mac	$743
D.	EP5457	Epson Expression 1680 Scanner	1600 x 3200 dpi	USB / SCSI	Win/Mac	$1901

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as prices may change due to daily fluctuations
and online discounts

1300 658 600

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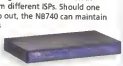
NetComm Personal VPN Router (VPN100)

Access your corporate or home network from wherever you are in the world with the NetComm Mobile VPN100. Advanced security features such as an active SPI firewall also ensure that you are protected from hackers. Simple to install and configure, this small and lightweight device is perfect for any travelling executive. Just connect the NetComm Mobile VPN100 Firewall to your notebook's USB port and access your network resources remotely from a hotel or another office via the Internet.

Websearch Code 228555 **$124**

NetComm Load Balancing Bandwidth Aggregator (NB740)

The NB740 combines the performance of two broadband connections in a single, easy to manage network gateway. The NB740 determines how Internet traffic is shared or it can automatically balance the load according to bandwidth usage levels. It also offers redundancy through the use of two WAN connections from different ISPs. Should one connection drop out, the NB740 can maintain Internet services by routing data to the active connection.



Websearch Code 249104 **$433**

NetComm ADSL Ethernet/USB Modem Router (NB1300Plus4)

An enhanced version of NetComm's NB1300, the NB1300PLUS4 provides affordable, high-speed, shared Internet access for home or office networks. It features an ADSL modem with USB and 10/100 Ethernet interfaces, a Router and a 4-port 10/100 Switch. Deployable in Bridge (modem), PPP Half Bridge, Router, NAT Router or NAPT Router modes, the NB1300PLUS4 is compatible with all major operating systems.
(NB the NB1300PLUS4 is Telstra (1143) approved).

Websearch Code 210008 **$146**

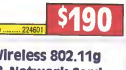
NetComm USB Ethernet Mini Print Server (NP3645)

The NP3645 USB Ethernet Mini Print Server is a stand-alone print server that connects direct to a USB printer for efficient print sharing. It supports most USB printers including laser, colour and bubble-jet and offers a USB port, which connects direct to the printer, an Ethernet port to connect to the network. The built in set-up Wizard also makes it easy to install. Operating systems supported include Windows 98se/2000/NT/MeXP, Unix and Apple Macintosh 9x or higher.

Websearch Code 247855 **$139**

NetComm Ethernet/USB Wireless ADSL Modem Router (NB1300Plus4W)

The NB1300 Plus4 Wireless builds on the 1300Plus4, offering an Advanced Security Firewall, ADSL modem, Router, 4-port 10/100 Switch and 11Mbps Wireless Access Point. It also features USB and/or Ethernet connectivity options as well as NetComm EasyConfig and Video tutorials



Websearch Code 224601 **$190**

NetComm ADSL Integrated Gateway wireless (NB5580W)

Recommended by PC World due to its features and userfriendliness, the NB5580W is the only true all-in-one communications device available today. It features an integrated ADSL modem, 54Mbps Wireless Access Point, advanced Stateful Packet Inspection Firewall, multiple VPN end-points and a 4-port Ethernet Switch to share network services between wired and wireless clients.

Websearch Code 212694 **$297**

NetComm 8-Port Home Network Switch (NP2008HS)

Unmanaged 10/100 Ethernet Home Switch with 8 x 10/100Mbps Ethernet ports, plug & play installation, auto-detection to set the optimum data rate and full 10Base-T or 100Base-TX auto-sensing. Compatible with Windows 95/98/2000/MeXP, Linux, MacOS 8.x/9.x/10.x systems

Websearch Code 224600 **$66**

NetComm In-Line Microfilter (EM1100R)

The EM1100R in-line microfilter is designed for use between existing PSTN devices (i.e. telephones and fax machines) and the telephone line. The microfilter enables these devices to continue to function normally over a combined ADSL & telephone line.

Websearch Code 209239 **$18**

Belkin Wireless 802.11g Router & Network Card Bundle

The Belkin 802.11g Wireless Cable/DSL Gateway Router lets users share files and a broadband Internet connection among their computers without using networking cables. It features 802.11g technology that makes accessing files and networked peripherals such as hard drives, printers, CD-ROMs, and DVDs easier than ever.

- Notebook Bundle (214614) $215

Desktop PC Bundle
Websearch Code 214615 **$215**

Belkin Wireless 802.11g Print Server

Easily add two USB printers to your wireless, or wired network. It features 802.11g technology that makes sending print jobs faster than ever, and includes a memory buffer that handles your graphics jobs effortlessly. Compatible with most USB, network-ready printers, and major operating systems.

Websearch Code 223764 **$199**

Belkin Wireless G USB Network Adapter

The Wireless G USB Network Adapter easily connects your USB-equipped desktop or notebook computer to your wireless network for Internet and file sharing.

- Fits any standard 1.0, 1.1 and 2.0 USB slot
- Offers backward-compatibility with all 802.11b network devices
- Features wireless 64- and 128-bit WEP Encryption
- Comes with Belkin Lifetime Warranty and free 24-hour technical support

NEW **Call for Pricing**

Belkin Bluetooth USB Printer Adapter

The fast and simple way to wirelessly connect your computing devices with your USB printer. The Bluetooth USB Printer Adapter (the Adapter) adds Bluetooth technology to your existing USB printer, allowing it to connect with all devices enabled with Bluetooth v1.1 technology.

NEW **$165**
Websearch Code 247185

Belkin High-Speed Mode (125mbps) Wireless G Desktop Network Card

The Belkin High-Speed Mode (HSM) Wireless G Desktop Network Card connects your desktop computer to your wireless network.

- 35% faster than standard 802.11g
- Advanced security features WEP and WPA
- Complies with 802.11g standards, backward compatible with 802.11b

NEW **Call for Pricing**

Belkin High-Speed Mode (125mbps) Wireless G Notebook Network Card

The Belkin High-Speed Mode (HSM) Wireless G Notebook Network Card connects your notebook computer to your wireless network.

- 35% faster than standard 802.11g
- Advanced security features WEP and WPA
- Complies with 802.11g standards, backward compatible with 802.11b

NEW **Call for Pricing**

Belkin High-Speed Mode (125mbps) Wireless G Router

The Belkin High-Speed Mode (HSM) Wireless G Router connects to your cable or DSL modem and enables your computers to share broadband Internet access at the highest speed available to date.

- 35% faster than standard 802.11g
- Advanced security features including WEP and WPA
- Complies with 802.11g standards, backward compatible with 802.11b products

NEW **Call for Pricing**

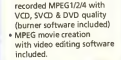
D-Link Wireless Security Camera (DCS-5300W)

- Enhanced Wireless Internet Camera
- CCD Sensor for Superior Quality Video
- Built-in Microphone for Monitoring and Recording
- High Quality MPEG-4 Short Header Mode Compression
- Built-In Motion/Audio Detection & Email Notification

$869
Websearch Code 248532

D-Link Audio/Video USB 2.0 Converter (DUB-AV200)

- Analogue to digital video conversion
- Audio capture with audio/video synchronization function
- Capturing and recording standard formats: AVI, MPEG1, MPEG2, MPEG4
- Direct burn-to-disc of recorded MPEG1/2/4 with VCD, SVCD & DVD quality (burner software included)
- MPEG movie creation with video editing software included.



$108
Websearch Code 223868

D-Link 4-port USB 2.0 and 3 Port Firewire Hub (DFB-H7)

- Blazing Fast Peripheral Connectivity
- Four USB 2.0 Ports with Speeds up to 480Mbps
- Two IEEE 1394 Firewire Ports with Speeds up to 400Mbps
- Plug & Play

$77
Websearch Code 249107

D-Link Wireless Media Player (DSM-320) Stream Audio, Video & Photos to your TV

The DSM-320 unites your network with your home entertainment center, allowing you to share, access, and enjoy your digital media. Whether it is music, videos, or photos in the comfort of your living room.The DSM-320 supports 802.11g wireless standards with transfer speeds up to 54Mbps, giving you maximum throughput for your digital media.

The DSM-320 Wireless Media Player supports and streams virtually all audio, video, and image formats stored on your PC With support for MP3, WMA and WAV audio files, listen to all of your music on your stereo.

Watch your stored videos in MPEG1/2/4, AVI, QuickTime or Xvid format on your TV or enjoy slideshows of your favorite photos in JPEG, JPEG2000, TIFF, GIF, BMP or PNG formats. Better yet, it's easy to access all your media files through the TV Interface using the remote control included with the DSM-320.

- Stream Media Content from Your PC to Your entertainment center
- Listen to Digital Music on Your Stereo System
- View Digital Photos, Slideshows and Video on TV
- Connects Wirelessly Using 802.11g or Via Ethernet
- Includes a Remote Control

$343
Websearch Code 223868

D-Link 54Mbps Wireless PCMCIA Card (DWL-G650+)

The DWL-G650+ Wireless CardBus adapter is an enhanced 802.11g high-performance, wireless adapter for notebook computers. Supporting high-speed wireless networking of up to 54Mbps, while providing seamless interoperability with all existing 802.11b and 802.11b+ wireless equipment.

DWL-G650 108Mbps	DWL-G650+ 54Mbps
$99	**$75**
Websearch Code...200293	Websearch Code...210414

D-Link 54Mbps Wireless PCI Adapter (DWL-G520+)

The DWL-G520+ wireless PCI card is an enhanced 802.11g high-performance, wireless card for desktop computers. This card supports high-speed wireless networking of up to 54Mbps, while providing seamless interoperability with all existing 802.11b and 802.11b+ wireless equipment.

DWL-G520 108Mbps	DWL-G520+ 54Mbps
$110	**$82**
Websearch Code...200292	Websearch Code...210413

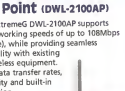
D-Link 54Mbps Wireless USB Key (DWL-G122)

A high-performance 802.11g wireless LAN USB adapter that connects your computer to a high-speed wireless LAN. This adapter simply plugs to your computer through a fast USB 2.0 interface to provide up to 54Mbps wireless speed. This adapter is an ideal solution for notebook and laptop PC users needing fast and standard mobile network connection.

DWL-122 11Mbps	DWL-G122 54Mbps
$63	**$120**
Websearch Code...211404	Websearch Code...224447

D-Link 108Mbps Wireless Access Point (DWL-2100AP)

The AirPlusXtremeG DWL-2100AP supports wireless networking speeds of up to 108Mbps (Turbo mode), while providing seamless interoperability with existing 802.11b wireless equipment. With high data transfer rates, better security and built-in bridge function.



DWL-2000AP+	DWL-2100AP
$150	**$185**
Websearch Code...210415	Websearch Code...222905

D-Link 54Mbps Wireless Broadband Router (DI-624+)

The DI-624+ is a high-speed 2.4GHz 802.11g wireless broadband Router with a built-in 4-port Fast Ethernet Switch. It incorporates high-speed wireless LAN with speeds of up to 54Mbps. This router lets you quickly share DSL or cable modem Internet connection, with or without the network wires.

DI-824 108Mbps	DI-824+ 54Mbps
$186	**$141**
Websearch Code...200295	Websearch Code...210416

D-Link 54Mbps Wireless VPN Router with Print Server (DI-824VUP+)

A 802.11g wireless VPN router that combines broadband Internet sharing with robust VPN firewall security, print server and built-in 4-port switch for ready printer and workstation connection.

DI-804HV	DI-824VUP+
$201	**$267**
Websearch Code...210411	Websearch Code...222034

D-Link 1-Port Print Server (DP-301P+)

Compared to software-based printer sharing, the DP-301P+ eliminates the need to have your printer connected to a host computer. With the DP-301P+, everyone on your network can be sure that their printing jobs go through at any time. Documents also print faster from the DP-301P+ than from software-based printer sharing solutions.

DP-300U	DP-301P+
$238	**$120**
Websearch Code...200271	Websearch Code...223902

D-Link 5-Port 10/100Mbps Switch (DES-1008D)

D-Link DE5-1008D is an unmanaged 10/100Mbps switch designed to enhance small workgroup performance while providing a high level of flexibility. Plug any port to either a 10Mbps or 100Mbps network to multiply bandwidth, boost response time and satisfy heavy load demands. 8 port 10/100Mbps Auto-sensing.

DES-1005D	DES-1008D
$46	**$65**
Websearch Code...OLK045	Websearch Code...OLK054

D-Link ADSL Modem with 54Mbps Wireless Router (DSL-G604T)

With a built-in ADSL interface, 802.11g high-speed wireless LAN, 4 10/100BASETX Ethernet switch ports and advanced router functions, this device gives your business a convenient and cost-effective way to install a secure, fast network with bottleneck-free link to the outside world.

DSL-504G	DSL-G604T
$154	**$192**
Websearch Code...222801	Websearch Code...248835

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as prices may change due to daily fluctuations and online discounts

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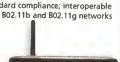
NETGEAR 108 Mbps Wireless Firewall Router (WGT624)

- Super Easy! – Smart Wizard gets you up and running in fewer than 5 clicks
- Smart Wizard assisted firmware upgrade automatically checks for new features and upgrades your network in just 1 click
- Over 10 security & privacy features including Double Firewall (SPI & NAT)
- 802.11g standard compliance; interoperable with existing 802.11b and 802.11g networks



$159
Websearch Code 211350

NETGEAR 108 Mbps Wireless PC Card (WG511T)

- Up to 108 Mbps to your notebook PC with Super G Technology (when used with the WGT624 router)
- New antenna technology allows greater range than ever before
- 802.11g standard compliance; interoperable with existing 802.11b and 802.11g networks.
- Setup is quick and easy with NETGEAR's Smart Wizard install assistant
- 128-bit WEP encryption, upgradeable to Wi-Fi Protected Access (WPA)

$106
Websearch Code 211349

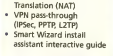
NETGEAR 108 Mbps Wireless PCI Adapter (WG311T)

- Up to 108 Mbps to your desktop PC with Super GTM technology (when used with the WGT624 router), 10x the speed of 802.11b
- New antenna technology allows greater range than ever before
- Setup is quick and easy with NETGEAR's Smart Wizard install assistant
- 802.11g standard compliance; interoperable with existing 802.11b and 802.11g networks.

$106
Websearch Code 246713

NETGEAR DG632 ADSL Modem Router (DG632)

- Speeds up to 140 times faster than dial-up
- Simultaneous Ethernet and USB connectivity.
- Network Address Translation (NAT)
- VPN pass-through (IPSec, PPTP, L2TP)
- Smart Wizard install assistant interactive guide



$129
Websearch Code 247686

NETGEAR Wireless Access Point and Router (WGR614)

- Faster Speeds up to 54 Mbps in 2.4 GHz mode
- Share your Cable/DSL Internet connection – with or without wires
- Smart Wizard: automatically detects and connects to your ISP
- True Firewall with SPI and NAT protection
- Easy set up with interactive install tutorial

802.11B MR814	802.11G WGR614
$104	**$133**
Websearch Code..1956072	Websearch Code..1960953

NETGEAR Wireless PCMCIA Adapter (WG511)

- Works with both IEEE 802.11b and 802.11g
- Speeds of up to 54 Mbps
- Office roaming for notebook PC users
- Shared broadband Internet access and resources.
- Wireless LAN Manager for location-specific profiles
- 128-bit WEP encryption

802.11B MA521	802.11G WG511
$49	**$79**
Websearch Code..203750	Websearch Code..195607

NETGEAR Wireless PCI Adapter (WG311)

- High-speed 802.11g at 2.4 GHz
- First-time-ever wireless video streaming
- Dynamic rate shifting
- 40/64 & 128-bit Wired Equivalency Protection encryption
- Virtual Private Network pass-through

802.11B MA311	802.11G WG311
$125	**$84**
Websearch Code..213270	Websearch Code..207056

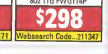
NETGEAR ADSL Firewall Router (DG834)

- Combines ADSL modem, router, 10/100 LAN switch, and firewall
- True Firewall with Stateful Packet Inspection (SPI) & Intrusion Control, Denial of Service (DoS)
- Virtual Private Network (VPN) pass-through
- Smart Wizard Install Assistant detects/connects to your ISP
- Shares a single IP address with up to 253 users

$159
Websearch Code 209970

NETGEAR Wireless Access Point and Print Server (FWG114P)

- True Firewall with Stateful Packet Inspection and Intrusion Detection
- Built-in 54 Mbps/802.11g Wireless Access Point
- Integrated USB Print Server & Network Address Translation (NAT) Routing
- DB-9 port included to support an ISDN or analogue modem connection
- Easy to use Smart Wizard Install Assistant



802.11B FM114P	802.11G FWG114P
$224	**$298**
Websearch Code..1931171	Websearch Code..211347

NETGEAR 108 Mbps Wireless Media Router (WGT634U)

- USB disk drive or memory stick connectivity 10x speed & 4x range* of 802.11b
- Smart Wizard install assistant for easy setup Double firewall (SPI + NAT)
- Supports both USB 1.1 and USB 2.0 Back up, share, and access your files wirelessly & remotely
- Actual results may vary depending upon operating environment.

$260
Websearch Code 223663

NETGEAR MP101 Wireless Digital Music Player

- Streams and plays MP3s and Windows Media format digital files from all of your networked PCs directly to your home stereo
- Remote control and vivid LCD interface for easy browsing of music collection
- Listen through your stereo, boom box, headphones, or powered speakers
- Compatible with 802.11b or 802.11g wireless networks

$273
Websearch Code 214096

NETGEAR 54 Mbps Wireless ADSL Firewall Router (DG834G)

- Combines modem, router, switch, 802.11g access point, and SPI True Firewall
- Up to 5X faster than 802.11b
- True Firewall with Stateful Packet Inspection (SPI) & Intrusion Control, Denial of Service (DoS), Virtual Private Network (VPN) pass-through
- Smart Wizard detects/connects to your ISP
- Works with both 802.11g & 802.11b

$227
Websearch Code 211348

NETGEAR Gigabit PCI Adapter (GA311)

- 1000 Mbps performance, 10x faster than Fast Ethernet
- 10/100/1000 Mbps auto-sensing
- Smart Wizard install assistant to make setup quick and easy
- Smart Wizard performance dashboard to monitor your throughput
- Supports all major operating systems

$41
Websearch Code 214459

NETGEAR 5-port Gigabit Ethernet Switch 10/100/1000 Mbps (GS105)

- Five 10/100/1000 Mbps Ethernet ports
- High-speed, auto-sensing, full-duplex connections
- Supports PC or Macintosh O/S
- Sturdy, space-saving form factor
- Silent operation for a peaceful work environment

$164
Websearch Code 209733

NETGEAR 10/100 Fast Ethernet Switch (FS608)

- Plug and Play installation, no configuration
- Auto-detects speed and duplex
- Auto Uplink makes the right connection
- 100 Mbps access/200 Mbps in full-duplex
- Vertical option saves space on your desk

5 Port FS605	8 Port FS608
$48	**$76**
Websearch Code..1949899	Websearch Code..195000

Secure Digital Cards

Sandisk Secure Digital Card

- 64MB (224416) $40
- 128MB (211595) $44
- 256MB (211596) $99
- 512MB (211597) $165
- 1GB (214386) $319

Sandisk Secure Digital Ultra

- 256MB (224108) $99
- 512MB (246875) $165

Memory Stick

Sony Memory Stick

- 64MB (SONY84) $62
- 128MB (191855) $81

Sony Memory Stick Pro

- 256MB (203998) $155
- 512MB (203999) $412

Sandisk Memory Stick Pro

- 256MB (246825) $121
- 512MB (224105) $242
- 1GB (246826) $484
- 2GB (214388) $946

Sandisk Memory Stick Pro Ultra

- 256MB (224102) $143
- 512MB (224103) $297
- 1GB (224101) $583

Memory Stick Duo

Sony Memory Stick Duo Magic Gate

- 32MB (223697) $45
- 64MB (223698) $61
- 128MB (212478) $89

Sony Memory Stick Duo Pro

- 256MB (214559) $149
- 512MB (213848) $395

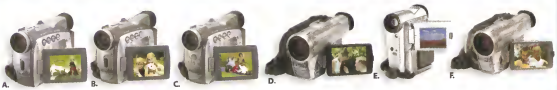
Sandisk Memory Stick Duo

- 64MB (224098) $66
- 128MB (224097) $88

Sandisk Memory Stick Duo Pro

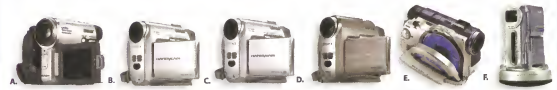
- 128MB (224112) $88
- 256MB (224099) $110
- 512MB (224087) $242

Canon Video Cameras



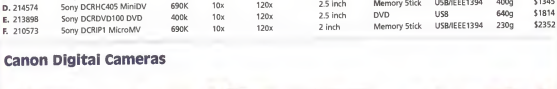
	Websearch	Product Description	CCD	Zoom (Optical)	Digital Zoom	LCD Colour Screen	Storage	Connection	Weight	Price
A.	223061	Canon MV700i MiniDV	800K	18x	360x	2.5 inch	Tape	IEEE1394	485g	$779
B.	223060	Canon MV730i MiniDV	800K	20x	400x	2.5 inch	MMC & SD	IEEE1394	485g	$949
C.	223059	Canon MV750i MiniDV	800K	22x	440x	2.5 inch	MMC & SD	IEEE1394	485g	$1159
D.	223065	Canon MVX200i	1330K	14x	280x	2.5 inch	MMC & SD	IEEE1394	500g	$1289
E.	207074	Canon MV6iMC MiniDV	420K	10x	400x	2.0 inch	MMC & SD	USB/IEEE1394	380g	$1379
F.	223064	Canon MVX250i	1330K	18x	360x	2.5 inch	MMC & SD	IEEE1394	500g	$1459

Sony Video Cameras



	Websearch	Product Description	CCD	Zoom (Optical)	Digital Zoom	LCD Colour Screen	Storage	Connection	Weight	Price
A.	214485	Sony DCRHC15 MiniDV	400K	10x	640x	2.5 inch	Tape	USB/IEEE1394	520g	$762
B.	223803	Sony DCRHC20 MiniDV	400K	10x	120x	2.5 inch	Memory Stick	USB/IEEE1394	380g	$924
C.	214571	Sony DCRHC305 MiniDV	400K	10x	120x	2.5 inch	Memory Stick	USB/IEEE1394	380g	$1093
D.	214574	Sony DCRHC405 MiniDV	690K	10x	120x	2.5 inch	Memory Stick	USB/IEEE1394	400g	$1345
E.	213898	Sony DCRDVD100 DVD	400k	10x	120x	2.5 inch	DVD	USB	640g	$1814
F.	210573	Sony DCRIP1 MicroMV	690K	10x	120x	2 inch	Memory Stick	USB/IEEE1394	230g	$2352

Canon Digital Cameras



	Websearch	Product Description	Megapixels	Optical Zoom	Storage	Batteries	Price
A.	222765	Canon Digital Camera PowerShot A75	3.2	3	Compact Flash	AA x 4	$399
B.	214304	Canon Digital Camera IXUS I	4	N/A	Secure Digital	NB-3L Li-ion	$439
C.	248331	Canon Digital Camera PowerShot A85	4	3	Compact Flash	AA x 4	$489
D.	222701	Canon Digital Camera IXUS 500	5	3	Compact Flash	NB-1L/LH Li-ion	$729
E.	227044	Canon Digital Camera PowerShot S60	5	3.6	Compact Flash	NB-2L/LH Li-ion	$799
F.	223866	Canon Digital Camera PowerShot S1	3.2	10	Compact Flash	AA x 4	$829

Fuji Digital Cameras

	Websearch	Product Description	Megapixels	Optical Zoom	Storage	Batteries	Price
A.	223810	Fuji Digital Camera FinePix A210	3.2	3	XD	AA x 2	$309
B.	223813	Fuji Digital Camera FinePix A340	4	3	XD	AA x 2	$330
C.	223814	Fuji Digital Camera FinePix S3000	4	6	XD	AA x 2	$419
D.	223817	Fuji Digital Camera FinePix S5000Z	3.1	10	XD	AA x 2	$569
E.	223816	Fuji Digital Camera FinePix F610	6.3	3	XD	NP-40 Li-ion	$829
F.	223818	Fuji Digital Camera FinePix S7000Z	6	6	XD	AA x 4	$949

CAN THE DEAL GET BETTER?
Call 1300 658 600 or visit www.ionh.com.au as prices may change due to daily fluctuations and online discounts

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MasterCard
American Express
RENT&SMART

Konica Digital Cameras

A.

B.

C.

D.

E.

F.

Websearch	Product Description	Megapixels	Optical Zoom	Storage	Batteries	Price
A. 246892	Konica Minolta Digital Camera DiMAGE Xg	3.2	3	Secure Digital	NP-200 Li-Ion	$419
B. 246889	Konica Minolta Digital Camera DiMAGE G-400	4	3	Secure Digital	NP-600 Li-Ion	$469
C. 246887	Konica Minolta Digital Camera DiMAGE Z2	4	10	Secure Digital	AA x 4	$649
D. 246879	Konica Minolta Digital Camera DiMAGE G-600	6	3	Secure Digital	NP-600 Li-Ion	$709
E. 246895	Konica Minolta Digital Camera DiMAGE A1	5	7	Secure Digital	NP-400 Li-Ion	$1385
F. 246885	Konica Minolta Digital Camera DiMAGE A2	8	7	Secure Digital	NP-400 Li-Ion	$1755

Nikon Digital Cameras

A.

B.

C.

D.

E.

F.

Websearch	Product Description	Media	Megapixels	Optical Zoom	Storage	Batteries	Price
A. 223820	Nikon Digital Camera Coolpix 2200	SD	2	3	Secure Digital	AA x 2	$299
B. 223808	Nikon Digital Camera Coolpix 3200	SD	3.2	3	Secure Digital	AA x 2	$449
C. 213474	Nikon Digital Camera Coolpix 3700	SD	3.2	3	Secure Digital	EL5 Li-Ion	$569
D. 209563	Nikon Digital Camera Coolpix 4300	CF	4	3	Compact Flash	EL1 Li-Ion	$619
E. 209835	Nikon Digital Camera Coolpix 4500	CF	4	4	Compact Flash	EL1 Li-Ion	$909
F. 209836	Nikon Digital Camera Coolpix 5400	CF	5	4	Compact Flash	EL1 Li-Ion	$1039

Olympus Digital Cameras

A.

B.

C.

D.

E.

F.

Websearch	Product Description	Megapixels	Optical Zoom	Storage	Batteries	Price
A. 223806	Olympus C-160 Digital Camera	3.2	No	XD	AA x 2	$230
B. 223091	Olympus C-310 Digital Camera	3.2	3x	XD	AA x 2	$275
C. 223092	Olympus C-460 Zoom Digital Camera	4.2	3x	XD	AA x 2	$408
D. 197296	Olympus MJU-300 Digital Camera	3.2	3x	XD	B-10L	$446
E. 223095	Olympus MJU-410 Digital Camera	4	3x	XD	B-10L	$536
F. 227027	Olympus C-60 Zoom Digital Camera	6.1	3x	XD	LI-12B	$715

Pentax Digital Cameras

A.

B.

C.

Websearch	Product Description	Media	Megapixels	Optical Zoom	Storage	Batteries	Price
A. 214297	Pentax Digital Camera Optio 33LF	SD	3	3	Secure Digital	2 x AA	$410
B. 224327	Pentax Digital Camera Optio S4	SD	4	3	Secure Digital	D-LI8 Li-Ion	$629
C. 214372	Pentax Digital Camera Optio 555	SD	5	5	Secure Digital	D-LI7 Li-Ion	$950

Sony Digital Cameras

A.

B.

C.

D.

E.

F.

Websearch	Product Description	Megapixels	Optical Zoom	Storage	Batteries	Price
A. 211281	Sony Digital Camera Cyber-shot DSCU50	2	4	Memory Stick	Ni-MH AA x 2	$438
B. 224517	Sony Digital Camera Cyber-shot DSCP735	4	3	Memory Stick	Ni-MH AA x 2	$471
C. 225493	Sony Digital Camera Cyber-shot DSCP1005	5	3	Memory Stick	Li-Ion NPFR1	$692
D. 226056	Sony Digital Camera Cyber-shot DSCV15	5	3	Memory Stick	Ni-MH AA x 2	$678
E. 196327	Sony Digital Camera Cyber-shot DSCF717	5	5	Memory Stick	Li-Ion NPFM50	$1091
F. 211563	Sony Digital Camera Cyber-shot DSCF828	8	7	Memory Stick	Li-Ion NPFM50	$1674

CompactFlash Cards

SanDisk

- 64MB (246545) $33
- 128MB (246546) $44
- 256MB (246547) $66
- 512MB (246548) $143
- 1GB (214223) $275
- 2GB (224089) $539

SanDisk Ultra II

- 256MB (246549) $88
- 512MB (246550) $176
- 1GB (224111) $352
- 2GB (224090) $704

FROM $33

xD Picture Cards

Olympus

- 32MB (209275) $35
- 64MB (208029) $55
- 128MB (224410) $90
- 256MB (197508) $165
- 512MB (224409) $300

SanDisk

- 64MB (214382) $44
- 128MB (224427) $88
- 256MB (214384) $176
- 512MB (214030) $275

FROM $35

MultiMedia Cards

Lexar

- 64MB (247017) $38
- 128MB (247024) $78

FROM $38

OCTOBER/NOVEMBER 2004

Computer Products at Rock Bottom Prices

LiteOn Internal 52/32/52 CDRW Kit

The LiteOn CDRW Drive includes Smartburn technology that automatically checks media quality and sets limit on burning speed to ensure succesful writing sessions. The IDE drive can be installed either vertically or horizontally, has buffer underrun prevention and also a vibration absorber mechanism.

$44
Websearch Code 211216

LiteOn Internal Combo Drive

This drive offers the best of both worlds. Not only does this drive offer 48x/24x/48x burn speeds for CD's, it allows the user to play DVD's. With innovated SMART-X technology that supports high speed digital audio extraction and high speed VCD data extraction, this drive is not only error free but fast.

$70
Websearch Code 208431

Century CD Storage Unit

Century CD is the industry's first affordable, intelligent CD and DVD storage unit, providing the user with a 100 disk capacity per unit. Manages up to 127,000 disks from a single interface on your PC.

$74
Websearch Code 224321

LaCie DVD±R/RW8x + Dual Layer DVD+R2.4x

Double Layer Technology
Store nearly twice as much data as current DVD media - 8.5GB on a single-sided DVD disc. Save up to 16 hours of VHS video, 4 hours of high-quality MPEG-2 DVD video or up to 8.5GB of data, audio or images. Large-capacity, double layer DVD media (DVD+R9) is also ideal for backing up computer systems or archiving MP3 libraries on a single disc.

DVD±RW in One Drive
This universal drive delivers four DVD formats in a single, slim device. This combination drive is also capable of writing to CD and DVD formats, which are compatible with nearly all existing DVD-Video players.

Record Custom DVDs In Minutes
Offering the fastest DVD record speed on the market, the LaCie d2 DVD±RW Double Layer Drive features 8x record speeds in DVD-R and DVD+R formats. This all-in-one rewritable drive also features FireWire and Hi-Speed USB 2.0 ports for easy connection to any Mac or PC.

Firewire/USB
Websearch WIN/MAC 226505 **$350**

Internal
Websearch WIN 235498 **$197**

LaCie d2 External Hard Disks

LaCie d2 range is a professional flexible system. Made of extruded aluminium and Zamac alloy, which are the same materials used in Formula 1 cars design for their unique features: robust, lightweight and fast cooling. Kensington cable lock and power lock for better security. Front power button and blue activity led, switches on/off with your computer. Supplied with drivers for Mac and PC. Drives can be used stacked horizontally or can be mounted in a 1U 19" rack (kit sold separately). All d2 external hard disks are 7200rpm.

- 160GB USB2.0 & Firewire & FB00 (223032) $359
- 200GB USB2.0 & Firewire & FB00 (193899) $434
- 250GB USB2.0 & Firewire & FB00 (221842) $484
- 400GB 8D USB2.0 & Firewire & FB00 (221B96) $845
- 500GB 8D USB2.0 & Firewire & FB00 (119623B) $882
- 1000GB USB2.0 & Firewire & FB00 (214528) $1770

*FB00 is a new FireWire interface doubling transfer rate -up to 100MB/s- of current FireWire interface. Requires specific FB00 card to take advantage of the performance.

LaCie PCMCIA & PCI Cards

Choose between LaCie FireWire PC & PCI Cards and USB 2.0 PCI Cards for your PC. Quickly and easily introduce FireWire 800, FireWire 400 or USB 2.0 to your computer to connect additional peripherals to your system.

PCMCIA Cards
- FireWire/FireWire800/iLink PCMCIA Card (246512) $124
- USB2.0 & FireWire PCMCIA Card (246513) $87

PCI Cards
- FireWire 800 PCI Card (202183) $122
- FireWire PCI Card (202182) $33
- USB 2.0 & FireWire PCI Card (207048) $85
- USB 2.0 PCI Card (202181) $37

LaCie Muiti Card Reader

- Supports eight types of media
- Plug and play convenience
- Compact design with versatile USB connectivity.
- An essential tool for digital photographers and marketing departments.
- Simple setup and convenient USB interface make it ideal for viewing images on a variety of digital media in both Mac and PC environments.
- Win/Mac

Websearch Code 225350 **$36**

LaCie Floppy Disk Drive

- Offers an ultra-thin, portable design to provide complete mobility, allowing you to move freely and take your data with you wherever you go
- Simple setup without terminators or device IDs
- Ideal for additional storage, archiving, data shuttle, and cross-platform data exchange
- Win/Mac

Websearch Code 193803 **$65**

LaCie USB DVD±RW
"design by F.A.Porsche"

Conveniently compatible with DVD+R/RW and DVD-R/RW media, the LaCie DVD±RW Drive lets you choose the DVD format you'd like to use for your personal projects. Create personal DVD videos, share family photos, store thousands of MP3s and back up as much as 4.7GB of important information.

Websearch Code 223462 **$407**

LaCie Drive USB2
"design by F.A.Porsche"

State-of-the-art design and awesome performance, with room to store up to 250GB. Built to be lightweight and durable, these drives can be easily moved for sharing and exchanging of files.

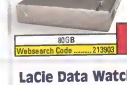
- 80GB 7200rpm USB2.0 (213173) $198
- 160GB 7200rpm USB2.0 (213909) $262

250GB
Websearch Code 223686 **$396**

LaCie Mobile drive USB2
"design by F.A.Porsche"

Specially designed for getting your files from point A to point B. Made with a durable exterior to withstand life on the go, this portable drive lets you safely travel with up to 80GB of personal information, including MP3s, audio tracks and photos.

- Mobile 40GB USB2.0 (213902) $277
- Mobile 60GB USB2.0 (226049) $356
- Firewire Available



80GB
Websearch Code 213903 **$474**

LaCie Data Watch

With the stylish LaCie Data Watch, you can safely transport up to 128MB of data on your wrist. Compatible with Mac and Windows operating systems, this watch is easily connected to Mac or PC computers via the convenient USB 2.0 interface.

- 256MB (246570) $224

128MB
Websearch Code 246569 **$121**

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Call 1300 300 303 or visit: www.lewis.com.au
as prices may change due to daily fluctuations and online discounts.

1300 658 600

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Pioneer DVR-A08XL 16x DVD-R/+R

Pioneer launches its new multiple format DVD writer. The DVR-A08XL is the industry's first DVD writer to support 16x write speeds on both DVD-R/+R along with the option to write at 4x speed on Double Layer media. This extends Pioneer's track record of establishing key performance benchmarks when introducing new DVD writers.

Features

Industry leading speeds of 16x with DVD+/-R and 4x with DVD+R DL

The DVR-A08XL records at a high-speed 16x with DVD+/- media, and 4x with double layer DVD+R media. RAM media can also be read.

Precision recording technology

Pioneer's exclusive performance enhancing features ensure high quality recording characteristics and low operational noise.

Performance Adjusting Firmware: Automatically adjusts between Performance mode and Quiet mode. Achieves an ideal solution by lowering disc rotation for quieter drive performance during DVD Video and Audio CD playback, while speeding up for high performance when required.

Included Software:

- Ulead DVD Movie Factory 3.5 SE Suite
- Video Studio 8 SE
- DVD Workshop 2 SE
- Nero 6 (New)

(all with AC-3 encoding)

Specifications

Write:

- 16x DVD-R/+R (to certified 8X media)
- 4x DVD+R DL (to certified 2.4X dual layer media)
- 4x DVD-RW/+RW
- 32x CD-R
- 32x CD-RW

NEW

NOW Writes 16x Speed DVD-R/+R

NEW

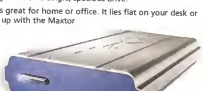
Beige		Black	
Webseach Code 248739	$244	Webseach Code 248738	$244

Maxtor OneTouch Personal Storage

It's not just data, it's your life. Save it. Store it. Back it up with the push of a button.

Just press the button and your files are backed up in one simple step. It's simply the faster backup. Faster than CD. Faster than a floppy. Faster than removable cartridge systems. Need storage? We're talking huge amounts—up to 300GB. Space for your photos, videos, graphics, music, documents and more. Spend less time searching for files by storing them on a single, spacious drive.

The drive, with its high quality, anodized aluminum case, is as attractive as it is flexible. It's great for home or office. It lies flat on your desk or stands upright to save space. It connects to FireWire or USB ports on a PC or Mac. It backs up with the Maxtor OneTouch button or runs automated backups using the included software, Dantz Retrospect Express. And you can customize the button to launch any application.



120GB - Perfect for home or office

The Maxtor Personal Storage external hard drive quickly adds storage and organisational space through your computer's USB port.

200/250GB - Perfect for video editing and high-end graphics

The Maxtor 7200RPM hard drive featuring both FireWire (IEEE1394, iLINK) and USB interface ports for your PC and Mac.

300GB - Perfect for storage hungry files

The Maxtor 300GB hard drive provides you with enough capacity to hold and organise your storage-hungry applications and files.

Features

- Patent-pending Maxtor OneTouch technology
- Plug and play storage
- Hot-swappable
- Anodized aluminum design
- Stands vertically or horizontally
- Customisable Maxtor OneTouch button
- Power management and on/off switch
- Whisper-quiet FDB motor
- Mac formatted (for Mac)
- Connect additional drives

80GB		120GB		160GB	
Webseach Code 225097	$260	Webseach Code 211129	$290	Webseach Code 246481	$349

200GB		250GB		300GB	
Webseach Code 211129	$429	Webseach Code 211130	$479	Webseach Code 211145	$529

Sony Internal Dual-Layer DVD Burner

Key features

- Supports Dual Layer Media
- 8X Max + & - DVD Recording
- 40X Max CD Recording
- 24X Max CD ReWriting
- 12X Max DVD Playback
- 40X Max CD Playback
- **External** (224512) $330

NEW

$165
Webseach Code 224330

Sony Internal 52/32/52X CD-RW Kit

Features 52X recording and playback. Incorporates new Ultra-Speed Rewriting support, buffer under-run protection and a unique dual speed operation. Designed for Desktop or Tower PC, comes with an interface cable and mounting screws.

- **Sony Internal 52x32x52x with Roxio CD Creator 5 OEM software** (210991) $62
- **Sony Internal 52x32x52x with Nero 5 OEM software** (210990) $66

$56
Webseach Code 210990

Sony Internal IDE 52/32/52/16x Combo Kit

This kit includes a combined CD Burner/ Rewriter and CD/ DVD Player. The drive features buffer under-run protection, fast Audio Extraction and a unique Dual Speed operation. At 48X Max it will record a CD in around 2 1/2 minutes.

NEW

$98
Webseach Code 214397

OCTOBER/NOVEMBER 2004

Seagate Barracuda Hard Drives

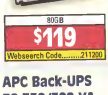
- 7200 RPM desktop performance
- 350 Gs nonoperating shock. Protect drive from shock and vibration
- DiscWizard software
- SoftSonic FDB Motor
- 2MB cache buffer
- 120GB (194590) $149
- 160GB (208071) $165

80GB
$119
Websearch Code 196562

Maxtor Hard Drives
ATA-133 7200RPM 8MB Cache

The solution for performance PCs with data intensive applications such as network attached storage, home networking devices, audio, video and other multimedia applications.

- 120GB (211201) $149
- 160GB (211202) $175
- 200GB (211199) $248



80GB
$119
Websearch Code..... 211200

APC Back-UPS ES 350/500 VA USB

Provides continued uptime and hardware protection for home or office users. Contains five Australian style outlets, phone, modem, fax and DSL data line surge protection, computer interface port for USB communications.

- 500 VA USB (2127B7) $220

350 VA USB
$179
Websearch Code 189734

Kensington USB Phone Charger

- Retractable USB Mobile phone charger with Car adapter
- Compatible with Nokia, Motorola, Siemens and Ericsson
- Small, smart and easy to carry
- Now there is no need to carry that heavy AC adapter while travelling
- Works with any USB port on Laptop, Desktop or Mac
- Easy to use - USB plug and play
- 2 year warranty

Websearch Code 223139
$39

Kensington Pocket Hub USB 2.0

- USB 2.0 technology up to 40 times faster than USB 1.1.
- Four USB ports handle up to four devices simultaneously.
- Perfect for travel: compact, slim, lightweight.
- Plug and play: ready to go, anytime and anywhere.
- Power adapter ensures full power to any peripheral
- 7 Port USB 2.0 Hub (22313B) $75

Websearch Code 223141
$49

SanDisk Cruzer Micro

Sandisk Cruzer Micro is a small USB Flash Drive that connects to a computer's USB port. With capacities ranging from 128MB to 512MB, users can easily store their key documents, pictures, music and videoclips on a Cruzer Micro and transfer them to another computer with a USB port.

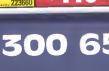
- Micro Cruzer
  128MB (248519)
  256MB (248520)
  512MB (248518)
- Mini Cruzer
  128MB (214564)
  256MB (213845)
  512MB (214670)
  1GB (247703)

HOT PRICE!
See www.csw.com.au for current pricing

Belkin USB2 Storage Device

Simply plug the Flash Drive into any USB port and it will be recognised as a removable drive. Each drive allows you to store data, copy, delete or move files between any notebook or desktop PC with ease.

- 256MB (223661) $189
- 512MB (223662) $389



128MB
Websearch Code 223660
$110

Kensington Wi Fi Finder

- Detects most available WiFi networks with the press of a button
- Three lights indicate signal strength
- Compact and lightweight
- Detects open hotspots from up to 200 feet
- Filters out other wireless signals, including cordless phones, microwave ovens and Bluetooth networks.
- No software or computer required.

Websearch Code 223147
$37

Kensington Portable Memory Card Reader

- USB 2.0 technology up to 40 times faster than USB 1.1
- Six card formats: MultiMediaCard, CompactFlash, Memory Stick, Microdrive, Secure Digital, SmartMedia.
- No need to switch out your digital camera or other data device; just insert the memory card for super fast upload.

Websearch Code 223145
$88

SanDisk Titanium

The 512MB Cruzer Titanium is designed to meet the needs of business and power users who place a premium on high durability and fast data transfers. SanDisk Cruzer Titanium is perfect for storing and transporting documents, pictures, presentations and music - anytime, anywhere, and under any conditions.

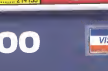
- 512 MB (246370)

HOT PRICE!
See www.csw.com.au for current pricing

Iomega Mini USB Drive

Comes complete with password software so only the user can access any of the important data that you may store on the drive. Being USB it requires no power or batteries.

- 256MB (214130) $124
- 512MB (214131) $240



128MB
Websearch Code 214133
$82

Kensington Universal AC/Car/Air Adapter

- Unique adapter combination handles standard wall outlet power (AC), car plug (DC), air connection cord (DC) and notebook cord
- Notebook input cord includes 10 interchangeable tips: Compatible with all major notebook makers, including Apple, Compaq, Dell, Fujitsu, HP, Toshiba, IBM, Sony, Gateway and other Pentium 4 and Centrino notebooks
- Over voltage protection, current limit, over temperature protection, short circuit protection
- Comes with a carry case

Websearch Code 223137
$187

Kensington Portable Universal Docking Station

- High-Speed USB 2.0 is up to 40 times faster than standard USB 1.1
- Instantly converts your notebook into a desktop workstation
- Plug-and-play functionality: one simple USB interface connects you instantly to your keyboard, mouse, printer, network and many other USB devices.

Websearch Code 223146
$149

SanDisk Cruzer MP3 Companion

The Sandisk Cruzer Micro MP3 Companion allows you to play MP3 files off your Sandisk Cruzer Micro USB Flash Drive (not included). Just slot the Sandisk Cruzer Micro in and get ready to bop to your favourite tunes!

Works with Sandisk Cruzer Micro only

Websearch Code 248349
$99

Sony Micro Vault USB 2.0 Storage Device

Simply plug directly into your computer's USB port, then transfer files as required. The drives features a storage capacity of 128MB along with Password lock, AutoZip, PC Lock & Auto Login software.

- 256MB (222512) $127
- 512MB (222513) $238

128MB
Websearch Code 222511
$78

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Call 1300 300 303 or visit www.csw.com.au as prices may change due to daily fluctuations and online discounts.

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Belkin SurgeMaster

A power surge or lightning strike can destroy your electronic equipment in an instant. The SurgeMaster range offers the best protection for all your sensitive electronic devices in your home or office. No amount of thunder and lightning will ever be able to scare away your protection. Be safe and smart; choose a SurgeMaster with telephone/data line protection and if you want to protect your AV equipment with coaxial connection, choose the surge protector that protects both.

Websearch	Product Description	Price
223718	Belkin Home Series Surge Cube	$27
223719	Belkin Home Series Surge Cube with Tel	$35
223721	Belkin Home Series 4-Way (2m Cord)	$49
223722	Belkin Home Series 4-Way (2m Cord) plus AV	$66
223750	Belkin Superior Series 6-Way (2m Cord) plus Tel	$99
223751	Belkin Superior Series 6-Way (2m Cord) plus Tel plus AV	$115
223753	Belkin Gold Series 7-Way (3m Cord) plus Tel plus AV plus RJ45	$149
223755	Belkin Gold Series B-Way (2m Cord) plus Tel	$129
223756	Belkin Gold Series B-Way (2m Cord) plus Tel plus AV	$145

APC Back-Ups RS 800 VA

- Lightning and surge protection
- Internet Fax/Modem/DSL surge protection
- Resettable circuit breaker
- Building wiring fault indicator
- APC Back-Ups RS 1000va (207121) $619
- APC Back-Ups RS 1500va (207122) $821

$604
Websearch Code 212932

Belkin Mini-Wireless Optical Mouse

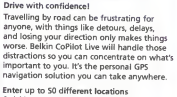
Perfect for the mobile professional. Take it on the road and use its optical precision on virtually any surface - anywhere you use your laptop. Works on your notebook computer from as far as 3 feet away.

$59
Websearch Code 196099

Belkin Wireless Keyboard & Optical Mouse

Uses digital radio technology to give you the luxury of using your keyboard and mouse anywhere within six feet of the receiver. No more cables to clutter your desktop. The mouse uses optical technology to deliver accurate signals from smooth, easy movements. Access the Internet and favorite applications using the seven multimedia keys and seven hot keys.

Belkin Classic keyboard and mouse (208863) $44



$55
Websearch Code 208862

Belkin Hi-Speed USB 2.0 7-Port Hub

Belkin's Hi-Speed USB 2.0 7-Port Hub features two top-loading downstream USB ports. Now you can enjoy fast access for temporary device connections such as USB thumb drives, media readers and for USB lights, fans and other accessories. Monitoring your device activity is simpler than ever with LEDs for master power status and all port activity.

$72
Websearch Code 223783

APC Surge Arrest Personal W/PH Protection

- Phone line protection
- 315 Joules Surge Energy Capacity.
- Child-safe outlets
- Protection Working Indicator - warns user if its circuitry is damaged
- No line protection (195420) $45

$59
Websearch Code APC037

Belkin Universal 800VA UPS

The 800VA offers protection for your computer against surges, spikes, blackouts and lightning stikes. It features serial and USB Ports, 4 battery backup sockets with surge protection, a $150,000 connected equipment and data recovery warranty. When the power goes off the computer stays on! Also available in 1000va & 1200va models.

$465
Websearch Code 221844

Belkin CoPilot Live PocketPC Edition

Connects wirelessly to your Pocket PC using the power of Bluetooth

Drive with confidence!

Travelling by road can be frustrating for anyone, with things like detours, delays, and losing your direction only makes things worse. Belkin CoPilot Live will handle those distractions so you can concentrate on what's important to you. It's the personal GPS navigation solution you can take anywhere.

Enter up to 50 different locations
Quickly and easily enter your journey and follow Belkin CoPilot's turn-by-turn spoken instructions.

Maintain peace of mind
Even if you miss a turn, hit traffic or encounter roadwork, you have nothing to worry about.

Always stay on track
Within seconds Belkin CoPilot will automatically re-route you. You'll still get spoken directions all the way to your destination.

Kit also Includes:

- Secure Digital Memory Card Pre-Loaded with Australian maps
- In-Vehicle Power Adapter for BT GPS and your Pocket PC
- Vent Mount
- Quickstart Guide
- Software CD with Desktop Planner
- Windhart Marine Navigation Software

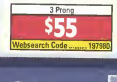
- Belkin CoPilot Notebook Edition USB version (246706) $815

Belkin CoPilot Live on-screen display (PocketPC not included)

$935
Websearch Code 246705

APC Surge Protection for Notebooks

- Surge protection device for notebooks, fax and answering machines
- 3 prong, C6 connector, protection working indicator
- Surge Energy Rating: 180 Joules
- Plug Style : IEC 320 C6
- Protection working indicator
- Weighs 0.11 Kg
- Dimensions: 3.18 X 3.81 X 12.19 cm (W x H x D)
- 2 Prong (197979) $55



3 Prong
$55
Websearch Code 197980

Belkin Complete Mobility Bundle

Belkin's Complete Mobility Bundle is designed to meet the needs of all mobile professionals. It represents a necessary addition to any notebook solution and includes a stylish notebook case, a USB 4 Port Mini Thumb Hub and a MiniScroller Optical Mouse all in the one pack at a value price.

$70
Websearch Code 246704

Computer Products at Rock Bottom Prices

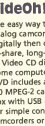
S-Media USB 128MB watch

The S-Media USB watch offers you the flexibility of always having storage with you. When was the last time you needed a floppy disc, a usb drive or a cd to copy something, now you can always be prepared with 128mb of storage.

$109
Websearch Code 212982

Belkin Bluetooth Hands-Free Headset

Designed to complete the comfort of hands-free communication easily, the Belkin Headset lets you activate calls with the answerfend button on your earpiece, and works from up to 30 feet from your phone.



$139
Websearch Code 227043

Adaptec VideOh! DVD

The easy way to convert analog camcorder movies digitally then create easy-to-share, long-lasting DVD or Video CD discs with your home computer. VideOh! DVD includes an external USB 2.0 MPEG-2 capture/encoder box with USB & A/V cables for simple connectivity to camcorders or other analog video device.

- VideOh! DVD PCI (197006) $189

USB
$225
Websearch Code 197008

Wacom Graphire3 6x8

The new WACOM Graphire3 makes it fun and easy to do any graphic related project on your computer. With Graphire3, you can do pen based drawing, sketching and illustration. The creative freedom with the patented pressure sensitive technology makes a wide variety of projects simple from fantastic homepage creation, painting with brush-like control to photo editing and re-touching. You also benefit from the pen based control with screen and document annotations on your Microsoft Office documents and even hand writing recognition in Microsoft Office XP or Inkwell in Mac OSX v10.2 plus hand-written e-mail.

Included Software

- Ulead Photo Explorer 8 SE Basic
- Adobe Photoshop Elements 2.0
- Photo Express 4 SE for Wacom
- Corel Painter Essentials 2

4x5 Silver
Websearch Code 209840 **$132**

6x8 Blue
Websearch Code 209763 **$197**

Wacom Intuos2

The Intuos2 professional graphics tablet is the latest step forward in the evolution of state-of-the-art input devices for graphics professionals and digital photographers. Wacom's Intuos2 Grip Pen feature 1024 levels of tip and eraser pressure, tilt, angle and direction, and two side buttons that act as modifier keys, keystrokes, or mouse buttons. As with all Intuos2 tools, the pen's functionality is completely customizable through Wacom's Control Panel software. The 9x12, 12x12 and 12x18 sizes feature dual track where you can use two accessories on the tablet at the same time and quick point areas for fast navigation. Intuos2 tablets come in a variety of colours.

- Win/Mac

Included Software

- Painter Classic
- Adobe Photoshop Elements 2. (for 4x5, 6x8 and 9x12 sizes)
- Comic Studio mini

- 6x8 (no software) (212007) $358
- 9x12 Ice Blue (214040) $641
- 9x12 (no software) (213079) $525

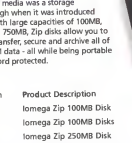
4x5 Ice Blue
Websearch Code 189279 **$275**

6x8 Ice Blue
Websearch Code 189516 **$429**

Iomega Zip Drive 250MB

Everything that makes Zip drives so popular, with added capacity and connectivity for even greater flexibility.

- USB cable provides both data and power so no external power source needed.
- Plug & play to quickly and simply safeguard, store and transfer your files.
- Great looking, lightweight and reliable!



250MB USB
Websearch Code 201149 **$198**

Iomega 750MB Zip Drive

Iomega Zip drives come with easy-to-use software and use durable password protected disks that fit into your shirt pocket. The 750MB drive offers the ultimate in capacity, speed and security, for your business, home and enterprise needs. Chose the best drive for you; USB2, Firewire or Internal Atapi.

- Firewire (211678) $297
- Atapi (197261) $198

750MB USB2
Websearch Code 213519 **$297**

Iomega Zip media

Iomega Zip media was a storage breakthrough when it was introduced in 1995. With large capacities of 100MB, 250MB and 750MB, Zip disks allow you to back up, transfer, secure and archive all of your critical data - all while being portable and password protected.

Websearch	Product Description	Quantity	Price
214157	Iomega Zip 100MB Disk	1 Pack Win/Mac	$17
214158	Iomega Zip 100MB Disks	10 Pack Win/Mac	$149
214159	Iomega Zip 250MB Disk	1 Pack Win/Mac	$20
214160	Iomega Zip 250MB Disks	2 Pack Win/Mac	$38
214161	Iomega Zip 250MB Disks	10 Pack Win/Mac	$165
209183	Iomega Zip 750MB Disk	2 Pack Win/Mac	$49
207603	Iomega Zip 750MB Disks Grey	10 Pack Win/Mac	$187

Wacom Cintiq 15x

The Cintiq 15x is a versatile tool for enhancing creative control, maximizing productivity, and communicating ideas in a natural and comfortable way. It features a compact design, clear LCD display, direct pen-on-screen control, wide viewing angle and adjustable stand.

- Win/Mac

Websearch Code 214038 **$1366**

Wacom Cintiq 18SX

The Cintiq 18SX is an 18 inch Large Format SXGA Interactive Pen Display, equipped with the highest standard TFT LCD panel. Having an easy fitting rubber grip and a fast response rate, Cintiq's pressure-sensitive Grip Pen will give you exact control and smoothness to your creative work. The original rotational feature and inclination display stand, enables everybody to work their own natural way or style.

- Win/Mac

Websearch Code 214039 **$4015**

Iomega Hard Drives

Iomega hard drives are compact and rugged with hot plug & play capability. They deliver high capacity, flexibility and performance for today's data-intensive applications and digital video/audio files. Iomega hard drives come with Iomega Automatic Backup and Symantec Norton Ghost 2003 Disaster Recovery software to protect your files and are Mac & PC compatible to make switching easy.

- 120GB USB2/Firewire (207786) $352
- 250GB USB/ Firewire (211846) $550

80GB External USB2
Websearch Code 207973 **$253**

Iomega Rev Drive 35GB

Read and write to the Iomega REV 35GB/90GB disks, which are pocket-sized, cartridges that hold 35GB of data (or up to 90GB of backup data with the included software compression).

- Iomega Rev Media 35GB 4 pack (223450) $319
- Iomega Rev Media 35GB Single Disk (222882) $99

Websearch Code 222880 **$558**

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Call 1300 300 658 or visit www.tech.com.au
Prices may change due to daily fluctuations and extra discounts

1300 658 600

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Pinnacle Studio 9

Pinnacle Studio version 9 easily allows home editors the convenience of creating spectacular movies using numerous professional quality features with integrated CD/DVD burning capabilities. Pinnacle Studio 9 provides image stabilisation, automated editing, automatic colour correction, noise removal, and surround sound, while maintaining total ease of use from start to finish.

- Upgrade (214227) $119
- Academic (214233) $145

Websearch Code 214226 **$220**

Pinnacle ShowCenter

Connect ShowCenter easily to your PC and your home entertainment center directly, or via your wired or wireless home network. ShowCenter finds all the music, movies and photos on your PC and automatically organizes them by category

Websearch Code 223668 **$517**

Pinnacle Studio MovieBox Deluxe

Make creative home movies on your PC from any camcorder, using either its DV or analogue outputs. Studio MovieBox Deluxe connects to your PC's Hi-Speed USB port and includes the full version of Pinnacle Studio version 9, the most powerful software video editor in its class.

Analogue and Digital Video in and out through your USB port

Websearch Code 224468 **$627**

Pinnacle PCTV & PCTV PRO

Fully featured TV Tuner PCI cards to watch TV on a PC in ultimate image quality.

- Watch TV and listen to stereo radio (Pro Version) on your PC even while using other applications.
- Capture in MPEG1 or MPEG2 and burn VCDs, SVCDs or DVDs with your CD or DVD burner
- Remote control
- PCTV (LAK129) $88

PCTV Pro

$220

Websearch Code LAK130

Pinnacle Studio AV/DV Deluxe 9

The top-of-class solution inside the Studio line. The included break-out box allows easy and convenient desktop connection to any analogue and digital video sources, in order to capture, edit and export your videos. You can create spectacular movies, using powerful and creative functionalities and the richest collection of filters and effects.

- Academic (214235) $440

Websearch Code 214229 **$550**

Pinnacle Liquid Edition Pro 5.5

Pinnacle Liquid Edition PRO features the power of Liquid Edition as the editing application and an AGP Accelerator card with an analogue & DV I/O breakout box that connect to your DV or analogue camcorder, DV deck or VCR. Full real-time directly on your output monitor.

- Upgrade (211726) $1210

NEW

Websearch Code 211725 **$1375**

Pinnacle Liquid Edition AV/DV

Pinnacle Liquid Edition AVDV 5.5, the powerful and feature-rich Liquid Edition editing software plus Pinnacle's MovieBOX DV external AVDV I/O box. You still get all the real-time features of Liquid Edition 5.5 at an UNBEATABLE PRICE!

NEW

Liquid AVDV only available until September 30

Websearch Code 246574 **$858**

Dvico TVix

Enjoy your digital movies, music and photos on your TV!! TVIX can be used as a multimedia jukebox, music tank, photo album and even as a portable storage. TVIX brings all of your digital contents to the living room so that you can enjoy movie, music and photos with your family, friends or colleagues.

$339

Websearch Code 248799

Hauppauge DEC2000T

The DEC2000T is a standard definition digital TV set top box with a difference - it has a USB port allowing capture of your favourite Digital TV programs to hard drive. You can use the DEC2000T stand-alone with your television set or attach a desktop or laptop PC via USB for live viewing, recording and playback.

Websearch Code 222387 **$359**

Hauppauge Nova T

The Nova T is a standard definition (future HD upgradeable) Digital TV PCI tuner card. The Nova T offers the most incredible picture quality available on a PC tuner card. Digital TV programs can be viewed live, pause/timeshifted or recorded to hard drive in their full digital quality without any loss. These can then be archived to DVD.

Websearch Code 211250 **$253**

Showshifter

Your computer, with a little help from Showshifter, will transform itself into the ultimate video and audio media system. Watch, pause and record TV, plus play video files, DVDs and MP3s - and control it all with an infrared remote.

Requires Hauppauge NOVA-t, PVR250 or PVR350.

NEW

showshifter

the home entertainment manager

Ideal for your home media centre

Websearch Code 248880 **$109**

Dvico Fusion HDTV

Dvico Fusion HDTV is a HIGH DEFINITION Digital TV Tuner that allows you to watch and record digital HD and SD TV on your PC. It's also a video capture card that lets you capture analogue video into your computer for archiving your old VHS tapes onto DVD or converting into high quality DivX video files.

$220

Websearch Code 224980

Hauppauge TV Tuner Cards

Bringing TV and broadcast data to your PC

	Webseach	Product Description	Interface	Audio	FM Radio	HW MPEG Recorder	Remote Control	S-Video In	Video In	Audio In	Price
A.	195954	WinTV-PVR-350	PCI	DBX Stereo	Yes	Up to 12MBits/sec	Yes	Yes	Yes	Yes	$480
B.	195313	WinTV-PVR-250	PCI	DBX Stereo		Up to 12MBits/sec	Yes	Yes	Yes	Yes	$385
C.	HAU004	WinTV-USB	USB	Mono				Yes	Yes	Yes	$209
D.	211242	PVR-USB2	USB2	Stereo	Yes	Up to 12MBits/sec	Yes	Yes	Yes	Yes	$499

Computer Products at Rock Bottom Prices

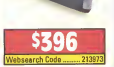
Apacer Audio Steno

Apacer Audio Steno BP300 is a USB flash drive with MP3 player and voice recorder. All functions and features are packed in a compact, easy-to-carry design. With Audio Steno BP300, you can enjoy the music and store data whenever you need. Use Audio Steno BP300 and fill your life with digital excitement.

$139
Websearch Code 222765

Apacer Disc Steno CP200

Apacer Disc Steno CP200 is a portable photo CD burner designed for photographers, business professionals and travellers. With no PC needed, Disc Steno CP200 makes it easier for you to copy data from flash cards to CD-R/CD-RW. In addition, you can display shots by connecting the unit to your television.



$396
Websearch Code 213973

Adaptec VideOh! DVD Media Center

A complete hardware and software solution, which includes a PAL TV tuner, MPEG-2 hardware encoder, free access to an online programming guide, as well as software for personal video recording and full-resolution DVD or video-CD creation.

- VideOh! Media Center PCI (209179) $249

USB
$278
Websearch Code 208344

Microsoft Basic Optical Mouse

Microsoft Optical Mouse Technology replaces the old-fashioned mouse ball and works on virtually any surface. Easy and comfortable to use, Basic Optical Mouse is the choice for value. USB/PS2, Win/Mac.

Basic Optical Mouse	5 Pack
$26	**$99**
Websearch Code...197239	Websearch Code...197240

Microsoft Wireless Optical Desktop Elite

Give your desktop all the best wireless features and functionality, with a cushioned palm rest, a Microsoft Wireless IntelliMouse Explorer with revolutionary new Tilt Wheel Technology, one-touch multimedia keys, "My Favorites" keys, and comfortable, ergonomic design.

Websearch Code 247545 **$130**

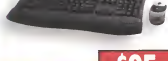
Logitech MX700 Cordless Optical Mouse

MX Optical Engine delivers more accuracy and control on more surfaces than ever before. Fast RF cordless technology delivers corded quality on a cordless device in a six foot range. Rapid charge base station ensures that your mouse is always ready. PS2/USB Win/Mac.

MX700	MX900
$99	**$136**
Websearch Code...193814	Websearch Code...211022

Logitech Cordless Access Duo Optical

Logitech Cordless Access Duo Optical features a comfortable, ultra-flat keyboard and a gently curved optical mouse, making it an excellent choice for home and office users. Advanced digital radio technology lets you work securely anywhere within six feet of your computer.



Websearch Code 209820 **$95**

Microsoft Notebook Optical Mouse

Microsoft Notebook Optical mouse features Microsoft Optical Technology for smooth, accurate performance. Contoured for comfort and scaled-down in size, Notebook Optical Mouse is always good to go; where ever and when ever you need it. PS2/USB. Win/Mac

Websearch Code 192444 **$46**

Microsoft Wireless Optical Desktop

Features a new Curve Design which provides enhanced comfort in a flat keyboard. The Zoom Slider, allows you to zoom in and out of images on-screen. Gain instant access to your favourite Web sites and files with the keyboard "My Favorites" Keys. The wireless optical mouse has a longer battery life, as well as Tilt Wheel Technology for side-to-side and down scrolling.

Websearch Code 247092 **$113**

Logitech Notebook Optical Mouse Plus

The simplest, most durable notebook mouse available. Just plug it in and start working. The optical sensor provides smooth tracking and maximum surface coverage. When you're ready to move, Logitech's integrated cord-wrap feature enables you to wind the cord neatly into the mouse for easy packing.

Websearch Code 222278 **$37**

Logitech Mobile Bluetooth Headset

Free yourself from tangled headset wires and still enjoy long hours of talk time with the Logitech Mobile Bluetooth Headset. This lightweight headset clips comfortably to your ear and connects cordlessly to your Bluetooth mobile phone. Best of all, it boasts an incredibly long battery life: one charge lets you talk for up to 7 hours.

Websearch Code 222579 **$121**

Microsoft Wireless Optical Mouse

Combines precise Microsoft optical tracking with revolutionary new tilt wheel technology, which enables side to side, as well as up and down scrolling. Your wireless freedom is made even more convenient with new longer battery life, providing many users with more than 6 months battery life. PS2/USB. Win/Mac.

Steel	Blue Moon
$64	**$56**
Websearch Code...210977	Websearch Code...210978

Microsoft Basic Wireless Desktop

Reliable Microsoft optical technology in a great value wireless mouse and keyboard. Keyboard features a Multimedia Centre to easily navigate music, pictures and videos and instantly access popular functions. The precise mouse is comfortably designed for both right and left hand. USB/PS2 Interface, Win/Mac compatible.

Websearch Code 210985 **$69**

Logitech QuickCam Orbit

The QuickCam Orbit features a black, ball-shaped camera that sits atop a nine-inch-high stand at your eye level so you get optimal face time during your video calls or video instant messaging sessions. When you move the camera follows. It also combines a microphone and connects through USB.

- Quickcam Messenger (202543) $76

QuickCam 4000	Orbit Camera
$146	**$179**
Websearch Code...222558	Websearch Code...208615

Logitech diNovo Media Desktop

Apart from being a bluetooth keyboard and mouse, the diNovo MediaPad is a Bluetooth remote commander for all your digital media. The MediaPad displays email or Instant message notifications and it lets you monitor media selection play back status, even when you're away from your desk.

Cordless Desktop MX	Media Desktop
$253	**$585**
Websearch Code...211021	Websearch Code...222037

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as prices may change due to daily fluctuations and online discounts.

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Imation CD-R 52x 10 Pack & CD-R 52x 100 Pack

Imation CD Media

Imation CD-R and CD-RW media have a high-quality dye layer that ensures lower failure rates. Each disc is tested to meet Imation's exacting standards to protect against the toughest environmental conditions

Websearch	Product Description	Price
210763	Imation CD-R 52x 700MB/80Min 10 Pack Slim Case	$8
247757	Imation CD-R 52x 700MB/80Min 25 Pack Spindle	$14
246983	Imation CD-R 52x 700MB/80Min 50 Pack Spindle	$26
247086	Imation CD-R 52x 700MB/80Min 100 Pack Spindle	$49
246309	Imation CD-R 40x 700MB/80Min Neon 25 Pack Spindle	$14
223713	Imation CD-RW 10x-24x 650MB/74Min Ultra Speed 10 Pack	$21
196653	Imation CD-RW Mini 185MB/21Min 10 Pack	$14
209037	Imation CD-RW 80min 700MB 4x 25 Pack Spindle	$14
246300	Imation CD-RW 80min 700MB 4x 10x High Speed Neon 10 Pack	$16
213359	Imation CD/DVD Neon Slim Jewel Cases 25 Pack	$11

Imation DVD 4x 1 Pack DVD+RW 4x 5 Pack

Imation DVD Media

Recording movies, creating interactive training, backing up or archiving massive amounts of data are a just a few options. DVD media is the next generation data storage solution, giving you huge storage capacities and incredible sound and picture quality.

Websearch	Product Description	Price
222704	DVD-R 4x 4.7GB 1 Pack	$3
247077	DVD-R 4x 4.7GB 5 Pack	$13
214122	DVD-R 4x 4.7GB 25 Pack	$58
213360	DVD+R 8x 4.7GB 1 Pack	$3
209039	DVD+R 8x 4.7GB 5 Pack	$13
222172	DVD+R 4x 4.7GB 25 Pack	$58
247065	DVD-RW 2x 4.7GB 1 Pack	$6
248798	DVD-RW 2x 4.7GB 5 Pack	$22
248797	DVD+RW 4x 4.7GB 1 Pack	$6
248800	DVD+RW 4x 4.7GB 5 Pack	$22

Imation 128MB USB 2.0 Flash Drive Micro $64

Imation USB 2.0 Flash Drive Micro

The Imation USB 2.0 Flash Drive is a compact, powerful flash drive. Featuring a unique "never lose" the cap swivel design to give you the sophisticated, professional look you seek from your personal technology. Weighing only one ounce, the drive fits easily around your neck, in your pocket or briefcase giving you convenient access to your drive, anytime, anywhere you are. Featuring lightening fast USB 2.0 drive speed - data can be read up to 8MB/second and written up to 7MB/second - saving you valuable time when transferring, sharing or storing your critical data.

Websearch	Product Description	Price
222111	Imation 128MB USB 2.0 Flash Drive	$64
222112	Imation 256MB USB 2.0 Flash Drive	$120
222113	Imation 512MB USB 2.0 Flash Drive	$215
222110	Imation 1GB USB 2.0 Flash Drive	$440

Imation DVD Dual Format 8x8x4x4 External Drive $275

Imation CD-RW and DVD Drives

Whether you choose CD or DVD to backup, Imation have the Optical Drive to suit your needs! Now you can create your own digital masterpieces and share them with ease. All Drive Kits come complete with everything you need to get started, including the latest software.

Websearch	Product Description	Price
213357	Imation CD-RW Drive Internal S2x32xS2	$66
224480	Imation DVD Dual Format 4x2.4x2x2 Slim External Drive While stocks last!	$242
248908	Imation DVD Dual Format 8x8x4x4 External Drive	$275

Imation Data Tape Super DLT 160/320GB $81

Imation 4mm, 8mm DLT, LTO & SDLT Tape Cartridges

Websearch	Product Description	Price
192766	Imation Data Tape 4mm 125m DDS-3	$13
192767	Imation Data Tape 4mm 150m DDS-4	$19
194261	Imation Data Tape AIT 2 8mm 230m 50/100GB	$88
194474	Imation Data Tape AIT 3 8mm 100/260GB	$95
192707	Imation Data Tape DLT IV 20/80GB (drive dependent)	$44
194262	Imation Data Tape Super DLT 160/320GB (drive dependent)	$81
192768	Imation Data Tape LTO Ultrium 100/200GB (drive dependent)	$49
196251	Imation LTO Ultrium Gen 2 200/400GB Cartridge	$88

Imation DVD-R Slim Movie Cases

Imation DVD-R Media is now available in Slim Movie Cases. New Slim Movie Cases are half the thickness of traditional cases, meaning you can store more than ever before. Record movies, create interactive training, back up or archive massive amounts of data. DVD media is the next generation data storage solution.

$33

Websearch Code 249308

Imation Disc Stakka

The Imation Disc Stakka is an automated carousel that gives you a simple and efficient way to manage and protect your disc library. Each unit stores and protects up to 100 data CDs, DVDs, music or game discs and links to your computer via a USB connection. The bundled OpdiTracker software enables you to search its database of stored discs by title, keyword, directory or file name to find and eject any disc within seconds.

$171

Websearch Code 214454

Imation DVD Internal Drive

The Imation DVD Internal Drive is a single drive that operates with the two most popular DVD formats in the market - plus and minus R formats, and supports various CD formats. At 8x speed - the fastest in the market today and built in features such as anti-vibration, SMART-X and SMART-BURN, users can be assured of smooth driving with the Imation DVD Burner.

$176

Websearch Code 224473

Apple iPod with Click Wheel

Incorporating the fabulous Apple Click Wheel that was first introduced on iPod mini. Offering up to 12 hours of battery life. Weighing in at just 158 grams. And getting slightly thinner with each new generation. iPod continues to define what a digital music player for Mac and Windows should be.
Win/Mac

- 40GB (247418) $635

Huge capacity, holds up to 10,000 songs

NEW

20GB
$485
Websearch Code 247437

Apple iPod Mini

Apple engineers squeezed all the best features of iPod into a case weighing just 3.6 ounces and smaller than any cell phone. iPod mini features an anodized aluminium case that resists stains and scratches. Like its (slightly) bigger brother, iPod mini gives you over 25 minutes of skip protection and lasts up to 8 hours on a single battery charge. So you won't pay a penalty for miniaturization.
Win/Mac

- Blue (247413) $385
- Gold (247414) $385
- Pink (247412) $385
- Silver (247432) $385

Carries up to 1,000 songs! 70 hours of music

NEW

Green
$385
Websearch Code 247430

HP DeskJet Cartridges

Websearch	Product Description		Price
224049	HP Ink Cartridge No 15 Black for DJ 810/812/840/845 - C6615DA	Twin Pack	$67
223829	HP Ink Cartridge No 45 Black for DJ 710C/720C/830C - 51645AA	Twin Pack	$71
247690	HP Ink Cartridge No 56 Black for DJ 5550 - C6656AA	Twin Pack	$47
247553	HP Ink Cartridge No 10 Black for DJ 2000C/2500C - C4844AA		$46
190163	HP Ink Cartridge No 11 Cyan for DJ 500/800 - C4836AA		$46
190162	HP Ink Cartridge No 11 Magenta for DJ 500/800 - C4837AA		$46
194445	HP Ink Cartridge No 11 Yellow for DJ 500/800 - C4838AA		$46
247544	HP Ink Cartridge No 14 Black - C5011DA		$35
248463	HP Ink Cartridge No 14 Colour - C5010DA		$46
192529	HP Ink Cartridge No 15 Black for DJ 810c/812c/840c/845c - C6615DA		$40
HPI032	HP Ink Cartridge No 17 Colour for DJ 840/845 - C6625AA		$44
HPI034	HP Ink Cartridge No 20 Black for DJ 610C/630C/640C - C6614DA		$40
130079	HP Ink Cartridge No 23 Colour for DJ 720C/880C/890C - C1823DA		$47
190611	HP Ink Cartridge No 26 Black for DJ 400/420/500 - 51626AA		$42
193787	HP Ink Cartridge No 27 Black for DJ 3420 - C8727AA		$26
193788	HP Ink Cartridge No 28 Colour for DJ 3420 - C8728AA		$30
224971	HP Ink Cartridge No 29 Black for DJ 600/610/630C - 51629AA		$42
190196	HP Ink Cartridge No 45 Black for DJ 710C/720C/830C - 51645AA		$42
224535	HP Ink Cartridge No 49 Colour for DJ 600/610C/630C - 51649AA		$44
224969	HP Ink Cartridge No 56 Black for DJ 5550 - C6656AA		$28
224381	HP Ink Cartridge No 57 Colour for DJ 5550C - C6657AA		$47
224527	HP Ink Cartridge No 58 Photo Colour for DJ 5550 - C6658AA		$35
21303	HP Ink Cartridge No 59 Grey Photo - C9359AA		$37
190354	HP Ink Cartridge No 78 Colour for DJ 900/1220C - C6578DA		$47
223939	HP Ink Cartridge No 78 Large Colour for DJ 900/1220C - C657BAA		$85

HP Mono LaserJet Toner Cartridges

Websearch	Product Description	Price
212302	HP Toner Cartridge for LaserJet 1010/1015 - Q2612A	$95
HWP001	HP Toner Cartridge for LaserJet 1100/3200 Series 2,500 Pages - C4092A	$81
227039	HP Toner Cartridge for LaserJet 1150 Series - Q2624A	$107
192755	HP Toner Cartridge for LaserJet 1200 Series 3,500 Pages - C7115X	$104
197391	HP Toner Cartridge for LaserJet 1300 Series 4,000 Pages - Q2613X	$121
HWP002	HP Toner Cartridge for LaserJet 2100/2200 Series 5,000 Page - C4096A	$136
206312	HP Toner Cartridge for LaserJet 2300 Series - Q2610A	$163
129465	HP Toner Cartridge for LaserJet 4/5 Series 6,000 Pages - 92298A	$130
192571	HP Toner Cartridge for LaserJet 4000 Series 10,000 Pages - C4127X	$173
192673	HP Toner Cartridge for LaserJet 4100 Series 10,000 Pages - C8061X	$173
196353	HP Toner Cartridge for LaserJet 4200 Series 12,000 Pages - Q1338A	$208
212299	HP Toner Cartridge for LaserJet 4300 Series - Q1339A	$276
129890	HP Toner Cartridge for LaserJet 8100 Series 20,000 Pages - C4182X	$255
212301	HP Toner Cartridge for LaserJet 9000 Series 30,000 - C8543X	$374
222948	HP Toner Cartridge for LaserJet 5P/5MP/6P/6MP Series - C3903A	$111
189212	HP Toner Cartridge for LaserJet 1200 Series 2,500 Pages - C7115A	$84
AUC125	HP Toner Cartridge for LaserJet 5L/6L Series - C3906A	$84
189501	HP Toner Cartridge for LaserJet 5000 - C4129X	$222

HP Colour LaserJet Toner Cartridges

Websearch	Product Description	Price
212288	HP Toner Cartridge for Colour LaserJet 1500/2500 Black - C9700A	$113
212289	HP Toner Cartridge for Colour LaserJet 1500/2500 Cyan - C9701A	$135
212290	HP Toner Cartridge for Colour LaserJet 1500/2500 Magenta - C9703A	$135
212291	HP Toner Cartridge for Colour LaserJet 1500/2500 Yellow - C9702A	$135
224747	HP Toner Cartridge for Colour LaserJet 2550 Black - Q3960A	$116
225373	HP Toner Cartridge for Colour LaserJet 2550 Cyan - Q3961A	$140
225371	HP Toner Cartridge for Colour LaserJet 2550 Magenta - Q3963A	$140
225372	HP Toner Cartridge for Colour LaserJet 2550 Yellow - Q3962A	$140
213667	HP Toner Cartridge for Colour LaserJet 3500/3700 Black - Q2670A	$179
213668	HP Toner Cartridge for Colour LaserJet 3500/3700 Cyan - Q2671A	$179
213670	HP Toner Cartridge for Colour LaserJet 3500/3700 Magenta - Q2673A	$179
213669	HP Toner Cartridge for Colour LaserJet 3500/3700 Yellow - Q2672A	$179
212282	HP Toner Cartridge for Colour LaserJet 4600/4650 Black - C9720A	$210
224533	HP Toner Cartridge for Colour LaserJet 4600/4650 Cyan - C9721A	$284
224534	HP Toner Cartridge for Colour LaserJet 4600/4650 Magenta - C9723A	$284
224532	HP Toner Cartridge for Colour LaserJet 4600/4650 Yellow - C9722A	$284
212287	HP Toner Cartridge for Colour LaserJet 5500 Black - C9730A	$304
194492	HP Toner Cartridge for Colour LaserJet 5500 Cyan - C9731A	$426
194493	HP Toner Cartridge for Colour LaserJet 5500 Magenta - C9733A	$426
194494	HP Toner Cartridge for Colour LaserJet 5500 Yellow - C9732A	$426

Visit www.csw.com.au for the full range of the above listed brands and other popular brands including Kyocera-Mita, Minolta, Fuji Xerox and Samsung not listed here.

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Canon Ink Cartridges

Websearch	Product Description	Price
222952	Canon Ink Cartridge for BJ 3000/S400/S4005P Black - BCI3EBK	$20
130499	Canon Ink Cartridge for BJ 3000/S400/S4005P Cyan - BCI3EC	$17
130498	Canon Ink Cartridge for BJ 3000/S400/S4005P Magenta - BCI3EM	$17
130497	Canon Ink Cartridge for BJ 3000/S400/S4005P Yellow - BCI3EY	$17
189066	Canon Ink Cartridge for BJ 4000/4100/4550 Black - BCI21BK	$13
189067	Canon Ink Cartridge for BJ 4000/4100/4550 Colour - BCI21C	$31
192570	Canon Ink Cartridge for BJ S2005P/i250/S300/i320/i350/i450/i470D Black - BCI24BK	$13
210402	Canon Ink Cartridge for BJ S2005P/i250/S300/i320/i350/i450 Black Twin - BCI24	$22
211894	Canon Ink Cartridge for BJ S2005P/i250/S300/i320/i350/i450 Colour Twin - BCI24	$44
192569	Canon Ink Cartridge for BJ S2005P/i250/S300/i320/i350/i450/i470D Colour - BCI24C	$25
190434	Canon Ink Cartridge for BJ S800/S820/S830D/S9000/i950/i9100/i990/i9950 Black - BCI6BK	$22
190436	Canon Ink Cartridge for BJ S800/S820/S830D/S9000/i950/i9100/i990/i9950 Cyan - BCI6C	$22
190437	Canon Ink Cartridge for BJ S800/S820/S830D/S9000/i950/i9100/i990/i9950 Magenta - BCI6M	$22
190439	Canon Ink Cartridge for BJ S800/S820/S830D/S9000/i950/i9100/i990/i9950 Yellow - BCI6Y	$22
190435	Canon Ink Cartridge for BJ S800/S820/S900/S9000/i950/i9100 Photo Cyan - BCI6PC	$22
190438	Canon Ink Cartridge for BJ S800/S820/S900/S9000/i950/i9100 Photo Mag - BCI6PM	$22
210442	Canon Ink Cartridge for BJ i70 Black - BCI15BK	$24
210443	Canon Ink Cartridge for BJ I70 Colour - BCI15C	$40
CAN064	Canon Ink Cartridge for BJ 210/210SP/240/255SP/265SP/1000SP Colour - BC05	$48
CAN236	Canon Ink Cartridge for BJ 210SP/255SP/265SP/1000SP Black - BC03	$35
225047	Canon Ink Cartridge for BJ S1005P/2000SP/4000/4100/4550/4650/5500 Black - BC20	$53
189067	Canon Ink Cartridge for BJ S1005P/4000/4100/4550/MPC50/70/75 Colour - BCI21C	$31

Epson Ink Cartridges

Websearch	Product Description	Price
193775	Epson Ink Cartridge for Stylus C41UX/SX/CX43UX/SX Black - T038	$14
200348	Epson Ink Cartridge for Stylus C41UX/SX/CX43UX/SX Colour - T039	$25
130914	Epson Ink Cartridge for Stylus C60/61 Black - T028	$38
189243	Epson Ink Cartridge for Stylus C60/61 Colour - T029	$34
211440	Epson Ink Cartridge for Stylus C63/CB3 Black - T0461	$18
211443	Epson Ink Cartridge for Stylus C63/CB3 Cyan - T047290	$20
211444	Epson Ink Cartridge for Stylus C63/CB3 Magenta - T047390	$20
211445	Epson Ink Cartridge for Stylus C63/CB3 Yellow - T047490	$20
208296	Epson Ink Cartridge for Stylus C70/CX/CB2 Black - T032190	$40
190623	Epson Ink Cartridge for Stylus C70/CB0 Cyan - T032290	$18
190624	Epson Ink Cartridge for Stylus C70/CB0 Magenta - T032390	$18
190625	Epson Ink Cartridge for Stylus C70/CB0 Yellow - T032490	$18
208314	Epson Ink Cartridge for Stylus CB2 Cyan - T042290	$17
208312	Epson Ink Cartridge for Stylus CB2 Magenta - T042390	$17
208313	Epson Ink Cartridge for Stylus CB2 Yellow - T042490	$17
213662	Epson Ink Cartridge for Stylus 440/460/640 Black - TO50190	$24
213665	Epson Ink Cartridge for Stylus 400/600/800 Colour - TO52090	$30
213709	Epson Ink Cartridge for R210/R310/RX510 Black - T0491	$17
213658	Epson Ink Cartridge for R210/R310/RX510 Cyan - T0492	$17
213661	Epson Ink Cartridge for R210/R310/RX510 Light Cyan - T0495	$17
213710	Epson Ink Cartridge for R210/R310/RX510 Light Magenta - T0496	$17
213659	Epson Ink Cartridge for R210/R310/RX510 Magenta - T0493	$17
213660	Epson Ink Cartridge for R210/R310/RX510 Yellow - T0494	$17
189102	Epson Ink Cartridge for Stylus 810/830U/925/935 Black - T026	$32
189101	Epson Ink Cartridge for Stylus 810/830U/925/935 Colour - T027	$26
EPS404	Epson Ink Cartridge for Stylus 870/890/895/1270/1290 Black - T007	$25
EPS406	Epson Ink Cartridge for Stylus 1270/1290 Colour - T009	$34

Lexmark Toner Cartridges

Websearch	Product Description	Price
195003	Lexmark Toner Cartridge for Optra T 25k – 12A5845	$446
195005	Lexmark Toner Cartridge for Optra T 52x – 12A6835	$418
195006	Lexmark Toner Cartridge for Optra T 62x – 12A6865	$462
208553	Lexmark Toner Cartridge for Optra T 632/634 – 12A7465	$448
207977	Lexmark Toner Cartridge for Optra T 630/632 – 12A7462	$332

Oki Toner Cartridges

Websearch	Product Description	Price
203349	Oki Toner Cartridge for B4300	$87
246802	Oki Toner Cartridge for C3100 - Black	$221
246805	Oki Toner Cartridge for C3100 - Cyan	$244
246804	Oki Toner Cartridge for C3100 - Magenta	$244
246803	Oki Toner Cartridge for C3100 - Yellow	$244
203396	Oki Toner Cartridge for C5200 / C5400 - Black	$75
203399	Oki Toner Cartridge for C5200 / C5400 - Cyan	$196
203398	Oki Toner Cartridge for C5200 / C5400 - Magenta	$196
203397	Oki Toner Cartridge for C5200 / C5400 - Yellow	$196
203444	Oki Toner Cartridge for C7300 / C7500 Black	$139
203445	Oki Toner Cartridge for C7300 / C7500 Cyan	$344
203446	Oki Toner Cartridge for C7300 / C7500 Magenta	$344
203447	Oki Toner Cartridge for C7300 / C7500 Yellow	$344

Verbatim DataLifePlus CD-R 80min 52x 10 Pack (Slim Case)

Verbatim's innovative "Super Azo" recording dye is optimised to provide stable and reliable high-speed recording and the industries widest range of compatibility for today's 52x CD-R drives. Features a dual-protection layer that safeguards the recording layer and provides a longer archival life.

$9
Websearch Code.....193846

Verbatim Vinyl CD-R 80min 10 Pack (Jewel Case)

A recordable disc designed after the popular and groovy 45-rpm record format. The colour-coded discs use Verbatim's original Azo Blue technology for superior audio writing performance on CD burners and broad read compatibility on car CD players.

- **50 Spindle** (212702) $29

$9.50
Websearch Code.....210182

Verbatim 4.7GB Movie Reel Video DVD's

These 4.7GB discs look, and even feel, like a Hollywood movie reel. These mini reels are perfect for home movies, business presentations and transferring files and come in a clear DVD case.

- DVD+R (214498) $9

DVD-R
$9
Websearch Code 214407

Computer Products at Rock Bottom Prices

Comsol USB 2.0 Flash Drive

Comsol USB 2.0 Flash Drives require no external power, are compact & lightweight, making them an ideal storage device for travelling. They also feature password security control to prevent unauthorised access.

- 32Mb (249109) $38
- 64Mb (249110) $47
- 128Mb (249111) $66
- 512Mb (249106) $198
- 1Gb (249105) $374

256MB
$110
Websearch Code 249096

Comsol Host Adapters

The 1394-PCI provides PCs with 3 FireWire ports, allowing you to connect high performance FireWire devices. The UPCI-502 is a 5 port USB 2.0 PCI controller card enabling data transfer rates of up to 480Mbps.

- UPCI-502 (249102) $39

1394-PCI
$44
Websearch Code 249101

ServerLink Star 2 Port KVM

Control two PCs with a single keyboard, monitor and mouse. Setting up a KVM has never been easier with the ServerLink Star. Ultra compact in size with cables already attached, just plug the cables into your PCs.

$79
Websearch Code 249180

Comsol USB 2.0 Minidrive – 2.2GB

Store up to 2.2GB of data with this ultra compact 1 inch hard disk drive that plugs directly into your USB port. The Comsol Mini Drive works like a flash drive but provides greater storage capacity and durability. It requires no external power and operates under Windows ME/2000/XP and Mac without having to load any drivers or software.

The Mini Drive's large capacity yet compact and lightweight design make it the ideal portable storage device for large files such as MP3 or MPEG. It also comes with an instant Auto Zip function that compresses files to save disk space.

The email function stores your mail settings which allows you to use Outlook Express, from any computer, to access your email when you are travelling. The Mini Drive can also save your Internet Explorer Favourites, giving you access to your favourite sites from wherever you are.

- Compliant with USB specification 2.0 and Version 1.1
- PC Lock function prevents unauthorized access
- Fast 4200 RPM operation and power-saving mode
- Supports Windows 98SE/ME/200/XP and Mac OS 8.6/9.0/1.0 and above
- Supports Linux 2.4/Red-Hat Linux 7.x and 8.x

$419
Websearch Code ...249504

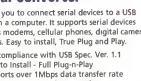
Comsol USB 2.0 Hubs

Add high-performance USB 2.0 peripherals to your PC. Connect high bandwidth devices such as scanners, digital cameras etc. True Plug and Play with no software required for easy installation. Available in Pocket and Desktop versions. Compliant with the USB 2.0 specifications and permits you to connect up to a maximum of 127 USB devices to your PC through daisy-chain.

Pocket	Desktop
$55	**$55**
Websearch Code..249089	Websearch Code..249090

Comsol USB 2.0 Docking Station with 10/100 LAN

The Comsol USB 2.0 Docking Station provides a single solution for you to connect your mouse, keyboard, printer and scanner to your portable computer. It contains USB2.0, Serial, Parallel, Mouse, Keyboard Port and Ethernet Ports. Easy USB installation makes adding new hardware a breeze. No complex installation or IRQ settings, just plug-play.

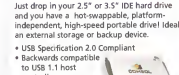


$143
Websearch Code ...249091

Comsol USB to PS/2 Keyboard & Mouse Adapter

Allows you to plug a standard PS/2 keyboard and standard PS/2 mouse into a single USB port on your computer.

- Easy installation - no software drivers required
- Bus Powered - External Power Adapter Not Required
- Complies to USB 1.0 and 1.1 Specification
- Support UHCI and OHCI USB Interface
- Supports Windows 98, ME, 2000, XP & Mac



$39
Websearch Code ...249092

Comsol USB to IrDA Infrared Adapter

Enable IrDA wireless data communication through a standard USB port. Ideal for wireless data transfer a standard USB port. Ideal for wireless data transfer digital camera etc.

- Easily enable IrDA function on the desktop PC via USB port
- Fully compatible with IrDA 1.1 and USB 1.1 specification
- Compatible with FIR 4Mbps, MIR, SIR and ASK 56Kbps

$69
Websearch Code ...249093

Comsol USB to RS232 Serial Converter

Allows you to connect serial devices to a USB port on a computer. It supports serial devices such as modems, cellular phones, digital cameras & PDAs. Easy to install, True Plug and Play.

- Full compliance with USB Spec. Ver. 1.1
- Easy to Install - Full Plug-n-Play
- Supports over 1Mbps data transfer rate
- Supports remote wake-up and power management
- No IRQ Required

$55
Websearch Code ...249100

Comsol USB 2.0 HDD Enclosures

Just drop in your 2.5" or 3.5" IDE hard drive and you have a hot-swappable, platform-independent, high-speed portable drive! Ideal as an external storage or backup device.

- USB Specification 2.0 Compliant
- Backwards compatible to USB 1.1 host controller
- Quick & easy installation

2.5 Inch	3.5 Inch
$69	**$99**
Websearch Code...249095	Websearch Code...249096

Comsol CardBus Adapters

Simply and quickly add high speed USB 2.0 or IEEE1394FireWire ports to your notebook!

- Quick & easy installation - ideal for any mobile executive.
- Supports 32 bit CardBus PC Card type II slots.
- Automatically switches to the peripheral's highest supported speed
- Supports Windows 98SE/ME/2000/XP & Mac

USB 2.0	FireWire
$59	**$59**
Websearch Code..249097	Websearch Code..249098

Comsol Combo CardBus

This Combo Firewire IEEE 1394a + USB 2.0 CardBus card is designed to offer a cost effective and reliable solution to users with notebook PC's that have no integrated IEEE 1394a and USB 2.0 support. Quick & easy installation - ideal for any mobile executive.

- Compliant with IEEE1394a standard and P1394a Supplement 4.0
- Compliant with Universal Serial Bus Specification Revision 2.0

$88
Websearch Code ...249099

Comsol USB 2.0 6-in-1 Multi Card Reader

The UCR-602 USB 2.0 Multi Card Reader is a convenient and fast way of exchanging data between your computer and Digital Camera, MP3, PDA etc.

- CompactFlash Card I and II
- SecureDigital Card
- MultiMedia Card
- Memory Stick
- Smart Media Card
- IBM Microdrive

$55
Websearch Code ...249100

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Autodesk AutoCAD LT 2005

Efficient, Secure, Affordable 2D CAD Software

AutoCAD LT 2005 is the affordable 2D CAD software that helps you create, plot, publish and share your 2D designs. You can quickly create tables, better manage large groups of layers and conveniently access frequently used content to work more efficiently. Sharing your data widely is a snap: even team members without AutoCAD LT software can view and mark up your published DWF files and you can instantly distribute multiple DWG files in a single step. Plus background plotting frees you to work while you print out your drawings. AutoCAD LT 2005 provides full DWG compatibility with AutoCAD 2005.

Full	Upgrade
$1950	$639
Websearch Code....222068	Websearch Code....222069

Autodesk AutoCAD 2005

Faster Data Creation, Easier Data Sharing

Creating a single drawing as efficiently as possible is important. Delivering a coordinated set of drawings in a timely manner directly benefits your bottom line. With AutoCAD 2005 you can do both. Everyday tools like the table object and tool palettes boost productivity, and the new Sheet Set Manager helps you control content across entire sets of related drawings, enabling you to lower the risk for errors. Then, in a single view, you can compose and collate sheet sets and share them with your project team using plots, eTransmit, or DWF (Design Web Format) files.

Full	Upgrade
$5989	$849
Websearch Code....222070	Websearch Code....222071

Inventor Series

- Autodesk Inventor
- Autodesk Mechanical Desktop
- AutoCAD Mechanical
- AutoCAD (included as part of AutoCAD Mechanical)

$253

Websearch Code.....249108

Building Series

- Autodesk Architectural Desktop
- AutoCAD (included as part of Autodesk Architectural Desktop)

$242

Websearch Code.....224114

Revit Series

- Autodesk Revit
- AutoCAD

$242

Websearch Code.....246306

AutoCAD and Autodesk VIZ also available separately.

Autodesk AutoSketch 9

AutoSketch 9 software provides a comprehensive set of CAD tools for creating precision drawings—from electrical details to floor plans, from conceptual sketches to product specifications, and much more. Offers straightforward drafting in a Windows XP-like environment plus tutorials and wizards for a fast start.

$198

Websearch Code.....248671

Autodesk QuickCAD 8

QuickCad is the most affordable design program that Autodesk offers, but its low price doesn't diminish its capabilities. It comes with plenty of productivity features that let you make technical designs and diagrams. With its short learning curve, QuickCAD lets you start drawing right away by offering a simple beginner interface, then as you grow familiar with its capabilities, you can change to advanced or expert levels.

$135

Websearch Code.....189591

Autodesk Symbols 2000

Autodesk Symbols 2000 simplifies routine drawing tasks and boosts productivity through a toolbar-style graphical interface, which guides you rapidly through a wide selection of technically correct symbols. With a click of the mouse symbols are placed easily and exactly where they are needed.

Architectural Series contains over 5,600 symbols for building design and documentation. Engineering Series containing over 10,800 symbols covering all aspects of Engineering.

Architectural/Engineering

$189

Websearch.....130191/130331

Autodesk Volo View 3

Using Volo View 3, team members can view, mark up, measure, print, and plot AutoCAD 2004, Autodesk Inventor 7, and raster formats as well as DWF (Design Web Format) files without having the original design creation software. The files display and print exactly as the document creator intended—with rich design information, such as layers, views, and measurements.

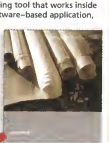
$299

Websearch Code.....208828

Autodesk Raster Design 2005

Now you can easily use and reuse existing design data in scanned maps, drawings, aerial photographs, and satellite imagery. Autodesk Raster Design 2005, the editing and image-processing tool that works inside your AutoCAD software–based application, can save hours of drawing time by converting raster to vector and combining drawings with real-world imagery.

Upgrades also available.



$2827

Websearch Code.....246299

Autodesk Viz 2005

Award-wining Autodesk VIZ provides a fluid 3D environment for modelling, rendering and animation. Whether you're an architect, land planner or mechanical designer, you can use Autodesk VIZ throughout the design process to develop and explore concepts and alternatives, communicate design intent to clients and validate your design to ensure they are error free. Autodesk VIZ, a multimedia software tool that brings your designs alive.

Upgrades also available.

$3291

Websearch Code.....246305

Microsoft Works 7

Works 7 is the latest version of the popular essential home productivity software. It includes a word processor, spreadsheet, database, calendar. Plus Works has new, professionally designed templates and a new tool to help organise common projects.

Licensing and academic licensing price available.

$87
Websearch Code 191400

Microsoft Digital Image Suite 9

Packed with all of the tools you need to organise your photos, edit them using hundreds of tools, print and share your work and archive photos for safekeeping.

Licensing and academic licensing price available.

- Picture It! Premium 9 (209498) $66

$161
Websearch Code 208738

Microsoft Encarta Premium Suite 2004

Encyclopedia with research and learning tools. Dictionary & Thesaurus, Literature Guides and Chart Maker.

Licensing and academic licensing price available.

- Standard (210856) $41
- Plus (209495) $77

CD-Rom DVD
$99
Websearch Code ..209496-209497

Microsoft Works Suite 2004

Works Suite includes five popular Microsoft home products in one, easy-to-use package. Works Suite includes Microsoft Works, Microsoft Word and the latest versions of Microsoft Money Standard, Microsoft Encarta standard, and Microsoft Picture It! Photo Premium.

Upgrade to Office 2003 from Works Suite

$197
Websearch Code 209495

Microsoft MSDN Universal 7

Provides priority access to essential resources for developers, including timely delivery of everything you need to build XML Web services and applications. Get uninterrupted access to the latest Microsoft technologies 24 hours a day 7 days a week online and through regular CD or DVD updates.

- Upgrade/Renewal (189644) $3817
- Full (130922) $4516

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Websearch Code 130917
$1367

Microsoft Exchange Server 2003 Standard

Designed to meet the messaging and collaboration needs of small and medium-size corporations. With Exchange 2003 Standard Edition, you get:

- Exchange 2003.
- The flexibility to be configured as a Microsoft Office Outlook Web Access front-end server.
- 16-gigabyte data storage maximum.
- Recovery Storage Group.
- Full (209489) $1998

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Websearch Code 209488
$1049

Microsoft Studio.Net Professional

Visual Studio.net Professional will enable developers to build next generation Internet applications that target any Internet device and integrate with any platform.

- Upgrade (213772) $835
- Full (213874) $1685

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Websearch Code 196749
$141

Microsoft Publisher 2003

Publisher 2003 is a comprehensive solution for creating and publishing a wide variety of publications for desktop printing, commercial printing, e-mail distribution, or viewing on the Web. Publisher 2003 looks and works more like other programs in the Microsoft Office System, making it easier to use the right Office tool for the task.

- Upgrade (210107) $171
- Full (210106) $289

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Websearch Code 210105
$145

Microsoft Visio 2003 Std

Microsoft Office Visio 2003 gives business and technical users the power to visualise and communicate ideas, information, and systems. Use the simple, flexible tools in Visio 2003 to easily create business and technical charts and graphics that capture your inspiration and communicate it with impact.

- Standard Upgrade (210120) $166
- Full (210119) $333

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Websearch Code 210118
$102

Microsoft Small Business Server 2003

Access your desktop remotely from any browser - anywhere in the world - 24x7. Collaborate on projects via an auto deployed Windows Sharepoint Services site Best of breed email and calendaring solution with Exchange 2003 and Outlook 2003.

- SBS 2003 Premium (211369) $2349

Standard
Websearch Code 211368
$1019

Microsoft Visual Basic .net Standard

Reengineered to be a first-class language on the Microsoft .NET Framework, it provides the easiest and most productive route for new developers and existing Visual Basic programmers to quickly build Windows-based applications.

- Full (197083) $165

*For non-commercial use only
Academic*
Websearch Code 197350
$97

Microsoft FrontPage 2003

Use enhanced design tools to produce better looking Web sites. Generate better code, or expand your code skills. Use built-in scripting tools for interactive results. And with professional coding tools, you can write code faster, more efficiently, and with greater accuracy. Connect with people and information in new ways by building Extensible Markup Language (XML) data-driven Web sites.

- Upgrade (210089) $179
- Full (210088) $349

*For non-commercial use only
Academic*
Websearch Code 210087
$161

Microsoft Visio 2003 Pro

Microsoft Office Visio Professional 2003 includes a full range of diagrams for business and technical professionals to create network and directory sevice diagrams, software, database, website diagrams, engineering drawings and building space and floor plans.

- Pro Upgrade (210117) $416
- Full (210116) $829

*For non-commercial use only
Academic*
Websearch Code 210115
$233

Microsoft SQL Server 2000 Standard

Relational Database Management and Analysis System. Great support for Web standards, powerful tools for system management and tuning, and exceptional scalability and reliability for your money make SQL Server 2000 the best choice for the next generation of enterprise-class database solutions.

- Full 5 Client (193920) $2299

*For non-commercial use only
Academic 10 Client*
Websearch Code 130171
$1489

Microsoft Visual C++ .net Standard

Visual C++ .NET is the most powerful C++ tool for creating the highest-performance software for Windows and the Web. Including features like IntelliSense Technology, Edit and Continue which significantly speeds the development process.

- Full (197469) $165

*For non-commercial use only
Academic*
Websearch Code 197470
$88

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Why get MS Office 2003?

Microsoft Office 2003 Editions deliver significant improvements over previous versions of Office, including:

- Advanced e-mail management tools to help you fight back against spam and viruses better than ever before.
- Improved automatic document recovery and compatibility with older files, which mean fewer worries about lost data.
- Brand-new collaboration features to allow you to share work easily and stay connected anytime, anywhere.

Microsoft Office	Student & Teacher Edition*	Standard Edition	Small Business Edition	Professional Edition
Word	●	●	●	●
Excel	●	●	●	●
PowerPoint	●	●	●	●
Outlook	●	●	●	●
Outlook with Contact Manager			●	●
Publisher			●	●
Access				●
Enhanced XML Technology				●
Enhanced IRM Technology				●

* For non-commercial use only. Must be a "Qualified Educational User." See Student and Teacher Edition 2003 package for details.

MS Office 2003 Editions work best with Windows XP

- If you use Windows XP or Windows 2000, then Office 2003 is the right choice for you.
- If you use Windows 98 or Windows Me, you should consider upgrading to Windows XP
- If upgrading to Windows XP is not an option for you, then Office XP is the best way to go.

Standard Edition Upgrade	Standard Edition Full	Small Business Upgrade	Small Business Full
$392	$653	$457	$738
Webserch Code 210093	Webserch Code 210092	Webserch Code 210086	Webserch Code 210097

*for non-commercial use only

Student & Teacher Edition*	Pro Edition Academic	Pro Edition Upgrade	Pro Edition Full
$258	$322	$531	$818
Webserch Code 210114	Webserch Code 210094	Webserch Code 210096	Webserch Code 210095

Office 2004 for Mac Student & Teacher

Microsoft Office 2004 for Mac Student and Teacher Edition offers:

- Full versions of the leading productivity applications from Microsoft.
- Rights to install on three computers in your household.

NEW

$281

Webserch Code 224817

Office 2004 for Mac Standard

Transform the way you create, share and manage ideas and information. Includes 2004 versions of Word, Entourage, Excel and PowerPoint and a host of groundbreaking new features. Licensing and academic licensing price available.

- Full (224819) $682

NEW

Upgrade

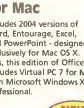
$413

Webserch Code 224818

Office 2004 Pro for Mac

Includes 2004 versions of Word, Entourage, Excel, and PowerPoint - designed exclusively for Mac OS X. Plus, this edition of Office includes Virtual PC 7 for Mac with Microsoft Windows XP Professional.

NEW Version Available Soon



Pre-Order Now

Microsoft Windows XP Home

Windows XP Home Edition is an excellent choice for most home users, with exciting new features that help you do more with your computer.

Microsoft Windows XP Professional

Windows XP Professional provides the highest levels of performance, productivity and security. It is the best choice for business users and for home users who demand the most from their systems.

*for non-commercial use only

Home

Upgrade	Full
$221	$421
Webserch Code MSS701	Webserch Code MSS700

Professional

Academic Upgrade*	Upgrade	Full
$145	$411	$592
Webserch Code MSS704	Webserch Code MSS703	Webserch Code MSS702

Microsoft Plus! Digital Media Edition

Share your photos and enjoy your music and home movies. Create vibrant photo stories with your narration, music and photo effects. Transform your PC into a full-featured party jukebox with visual effects while protecting your personal information and restricting access to other applications. Copy your aging cassette tapes and vinyl records into clean, vibrant digital files using hiss and pop reduction, track splitting and more.

$39

Webserch Code 194622

Microsoft Project Standard 2003

Microsoft Office Project Standard 2003 is used by project managers who need a desktop tool to manage their projects independently but who do not require strong coordination with other project managers or the ability to manage resources from a central repository.

- Upgrade (210110) $535
- Full (222991) $935

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Academic*

Webserch Code 210108

$116

Microsoft Project Professional 2003

Microsoft Office Project Professional 2003 is the desktop enterprise project management program that is used with MS Office Project Web Access and MS Office Project Server 2003. All the core scheduling tools in Project Standard 2003, plus powerful portfolio and resource management capabilities when connected to Project Server 2003.

- Upgrade (210112) $935
- Full (210111) $1549

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Academic*

Webserch Code 209772

$294

Windows Server 2003

Windows Server 2003 Standard Edition is the network operating system for small organisations and departmental use. It delivers intelligent file and printer sharing, secure Internet connectivity, centralised desktop application deployment, and Web solutions that connect employees, partners, and customers.

- Std 5 Client (195945) $1595
- Std 10 Client (195946) $1888

Enterprise Available.

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Std 5 Client Academic*	Std 10 Client Academic*
$685	$835
Webserch Code 195944	Webserch Code 195947

Extensis Portfolio 7

Portfolio is the perfect tool for tracking, organising and distributing digital photos and other image files. Transform your chaotic jumble of digital files into a fully searchable catalog in minutes.

$330
Websearch WIN/MAC ..247150

Extensis Suitcase X1 for Mac OS X

With unmatched font preview options, auto-activation, corrupt font detection and repair, duplicate font management and more. An integral part of the creative workflow.

- **Academic** (211119) **$99**
- **Upgrade** (247144) **$88**

Full
$154
Websearch Code 211070

Extensis Photo Imaging Suite

A collection of image and workflow-enhancement tools for the professional and aspiring photographer. The Suite enables today's photographers to digitally catalog and distribute their work, as well as quickly and intuitively scale, mask, enhance and add border effects to images in Adobe Photoshop.

Photo Imaging Suite
$715
Websearch Code 211417

Adobe Creative Suite Standard & Premium

The Adobe Creative Suite (CS) is an integrated design environment that combines the most complete upgrade in Adobe's history - featuring full, new versions of the tools you rely on most for image editing, illustration, page layout, and cross-media output - with innovative Version Cue file-management features, a smooth Adobe Portable Document Format (PDF) workflow and comprehensive design resources. Create and publish content for print and the Web faster and more easily than ever before, all at an outstanding value. Adobe integration makes it possible. The Adobe Creative Suite makes it affordable.

CS Standard Includes:
- Adobe Photoshop CS
- Adobe Illustrator CS
- Adobe Indesign CS
- PageMaker Plug-in Pack
- Version Cue
- Training CD

Upgrade from Photoshop
Websearch WIN 222520
Websearch MAC 222521
$965

Full
Websearch WIN 247546
Websearch MAC 222527
$1565

- Premium Academic Win (210945) $598
- Premium Academic Mac (222519) $579

CS Premium Includes:
- Adobe Photoshop CS
- Adobe Illustrator CS
- Adobe Indesign CS
- Adobe GoLive CS
- Adobe Acrobat Professional
- PageMaker Plug-in Pack
- Version Cue
- Training CD

Upgrade from Photoshop
Websearch WIN 222524
Websearch MAC 222525
$1239

Full
Websearch WIN 222495
Websearch MAC 222518
$1929

Adobe Photoshop® CS

Get superior results faster with industry-standard Adobe Photoshop CS and its integrated Web production application, Adobe ImageReady CS software. Graphic and Web designers, photographers, and video professionals can take advantage of indispensable features that include improved file management, new design possibilities, a more intuitive way to create for the Web, and support for 16-bit images, digital camera raw data, and non-square pixels. Now you can create the highest quality images more efficiently than ever before.

- Upgrade $329
- Academic $489

Full
Websearch WIN 210744
Websearch MAC 210743
$1129

Adobe Illustrator® CS

Adobe Illustrator CS is an essential tool for anyone who needs to express ideas visually in print, on the Web, and in any other medium. Powerful new features, including 3D graphics effects, character and paragraph styles, and innovative text composition controls, deliver indispensable design options to help you explore your creative vision.
And enhanced support for Adobe Portable Document Format (PDF), expanded print capabilities, faster performance, and tight integration with other Adobe products as well as Microsoft Office make it easier than ever to efficiently publish your artwork anywhere.

- Upgrade $352
- Academic $165

Full
Websearch WIN 210747
Websearch MAC 210748
$888

Adobe InDesign® CS

Adobe InDesign combines extraordinary production power and creative freedom to take page design to a new level. With InDesign CS, you can produce pages quickly and output them reliably. Its intuitive creative toolset helps you refine design ideas rapidly. The ability to import native Photoshop, Illustrator and Adobe Portable Document Format (PDF) files saves significant production time. Plus, InDesign, Photoshop and Illustrator software share a standard Adobe interface, so you can get up to speed quickly and work more efficiently with tightly integrated tools.

- Upgrade $349
- Academic $245

Full
Websearch WIN 210752
Websearch MAC 210751
$1269

Adobe InDesign® CS PageMaker Edition

Adobe InDesign CS PageMaker combines the full version of InDesign CS with the Adobe PageMaker Plug-in Pack to provide an exclusive upgrade path from PageMaker. Popular PageMaker tools ease the transition to InDesign. Professionally designed templates introduce you to the advanced layout capabilities of InDesign. And extensive training materials help you master InDesign quickly. What-ever you use PageMaker for now, you can build on your experience to hit the ground running with InDesign.

$697

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Adobe Acrobat® 6.0 Standard

Streamline business document exchange and review. Enables business professionals to easily convert any electronic or paper document - even a Web site - to a reliable Adobe Portable Document Format (PDF) file for exchange and review with colleagues and customers.

Create and exchange electronic documents

Easy Adobe PDF creation, document merge, scanning to Adobe PDF.

Streamline document reviews

Review management, accurate comments, comment summaries.

Protect sensitive documents

Password protection, 128-bit encryption, digital signature support.

- Upgrade $189
- Academic $149

Full
Websearch WIN 196180
Websearch MAC 196173

$461

Adobe Acrobat® 6.0 Professional

Advanced control over document exchange and output. Enables business, creative and engineering professionals who work with graphically complex documents to improve the reliability and efficiency of business-critical document exchange. Acrobat Professional offers all the benefits and features of Acrobat Standard and more.

Benefits for business professionals

Create and combine documents for review, streamline review management, use robust commenting tools, efficiently integrate comments, create forms, create secure, searchable archives

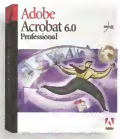
Benefits for engineering professionals

Create rich, layered documents, benefit from enhanced file viewing and navigation, comment using specialised tools

Benefits for creative professionals

Preflight and preview content, create rich-media Adobe PDF files, create forms, produce high-quality output

- Upgrade $279
- Academic $221



Full
Websearch WIN 196182
Websearch MAC 196181

$695

Centennial Media Illustrator CS

Master this versatile graphic design program with this set of training CDs. Centennial Media will take you step by step through the powerful tools and special features of Adobe Illustrator CS with easy to follow teaching techniques.

$330

Websearch Code 213183

Adobe Premiere® Pro 1.5

Adobe Premiere Pro is a revolutionary nonlinear video editing application. Real-time video and audio editing tools give you precise control over virtually every aspect of your production. From advanced color correction to 5.1 surround sound mixing, you have the tools you need at your fingertips. Plus, flexible import and export options reduce format constraints. Built for the superior performance of Microsoft Windows XP systems, Adobe Premiere Pro takes video production to an entirely new level.

- Upgrade $349
- Academic $333

Full
Websearch WIN 226108

$1252

Adobe Video Collection Pro 2.5

The Adobe Video Collection Professional delivers powerful, integrated tools for Windows based video production. Prepare layered images for video with Adobe Photoshop. Transform video into compelling stories with Adobe Premiere Pro. Create visual effects for the most demanding production environments with Adobe After Effects Professional. Author interactive, multi-language DVDs with all-new Adobe Encore DVD. Enhance all of your productions with multitrack audio accompaniments created using the professional tools in Adobe Audition. The Adobe Video Collection pairs creative control with the ability to deliver professional results for film, video, DVD or the Web.

Includes:

- Adobe Premiere Pro
- Adobe Photoshop CS
- Adobe After Effects
- Adobe Encore DVD
- Adobe Audition
- Academic $933

Full
Websearch WIN 224398

$2718

Centennial Media InDesign CS

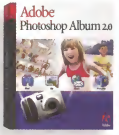
Delivering tight integration with other Adobe graphics applications with easy-to-use tools that reduce elaborate design tasks to a few quick steps, and built-in support for publishing pages anywhere. Ideal for classroom training and lesson content.

$220

Websearch Code 213184

Adobe Photoshop Album 2.0

Finding and organising your digital photos is a snap with Photoshop Album. Now you can see all of your pictures in one convenient place, instantly sort them by date or use keywords to organise photos by people, places, events or any other subject you choose. Easily import your photos from your digital camera with one click. Quickly fix common photo problems with the Single Click Fix button, eliminate red eye or crop out unwanted areas of your photos.



Websearch Code 211248

$79

Adobe GoLive® CS

Adobe GoLive CS delivers what you need to create professional Web sites. Work with Adobe Photoshop, Adobe Illustrator, and Adobe Portable Document Format (PDF) files directly within GoLive without switching between applications. Share Adobe InDesign files for true cross-media publishing across multiple devices. Maximize your productivity with a creative Web design environment that suits your style. Design without compromise using powerful tools that support industry standards, including world standards for mobile and handheld devices.

- Upgrade $349
- Academic $127

Full
Websearch WIN 210755
Websearch MAC 210756

$676

Centennial Media Photoshop CS

The graphics industry worldwide relies on the power of Photoshop. Students will be well prepared for future employment if they have a sound understanding of this software.

$407

Websearch Code 213181

Centennial Media Training CD-ROM's

Centennial Media provides the solution through interactive CD computer training of the highest standard that is also convenient, flexible and extremely cost-effective.

DreamWeaver MX 2004
$330
Webserach Code 213372

FireWorks MX 2004
$264
Webserach Code 213373

Flash MX 2004
$264
Webserach Code 213371

Macromedia Web Publishing System

The Macromedia Web Publishing System is a scalable, complete solution for businesses to affordably build, manage, and publish to websites. The Web Publishing System consists of Macromedia Studio MX 2004 with Flash Professional, Macromedia Contribute 3 with FlashPaper 2, and Contribute Publishing Services. The system meets the full spectrum of needs for web developers, IT managers, and business professionals—empowering users to easily publish to the web within a centrally controlled, standards-based environment.

NEW

10 User
Webserach Code 248916
$3745

Macromedia Contribute 3

Macromedia Contribute 3 redefines web publishing, making it an activity open to everybody, everyday, requiring no technical expertise. This release meets the full spectrum of needs for business professionals, web professionals, and IT decision makers alike. Contribute 3 balances the need to empower users with web developers' requirements for administrative controls and support for standards. As a key element of the new, enterprise-ready, scalable Macromedia Web Publishing System, and powered by the same market-leading technology as Macromedia Dreamweaver, Contribute 3 lets everyone in an organization publish to websites, bringing them alive with up-to-date content and effective communication.

NEW

Full
Webserach Code 248870
$242

Macromedia Studio MX 2004

Macromedia Studio MX 2004 integrates the leading professional tools for developing the full range of web sites and internet applications. Developers can build websites and applications with Dreamweaver, create interactive content with Flash, generate web graphics with Fireworks, and incorporate vector graphics with FreeHand. The consistent user interface and seamless integration across the tools in Studio MX 2004 streamline web development workflow, enhancing productivity and ease-of-use. For developers delivering rich interactive applications, Studio MX 2004 is also available with Flash Professional.

- Academic (209828) $310
- Upgrade from MX (210076) $660
- Upgrade from any Macromedia product (210075) $815

Full
Webserach WIN/MAC 209214
$1455

Macromedia RoboDemo 5

RoboDemo records any on-screen activity to instantly create a Flash simulation, with visible and audible mouse clicks. Easily enhance simulations with text captions, audio, video, animations, click boxes, images and more. RoboDemo is affordable simulation software that is SCORM /AICC compliant, and includes quizzing, scoring, branching and text-entry field features to develop truly effective simulations for your elearning program. With small file size and high resolution, simulations can easily be viewed on the Web or burned to CD for rapid delivery. RoboDemo also seamlessly integrates with Flash, giving you ultimate design and editing power.

- Upgrade (223748) $524

Full
Webserach WIN/MAC 222747
$815

QuarkXPress 6

Much more than a page layout tool, QuarkXPress 6 provides proven performance with graphics and colour management, text processing, Web-page design, XML, output and more!

- Supports Mac OS X v10.2, Windows 2000, and Windows XP.
- Synchronise text for speed and accuracy - save time and reduce the number of data entry errors.
- Create PDF files directly from QuarkXPress without having to buy third-party software.
- Upgrade from 4 $979
- Upgrade from 5 $660

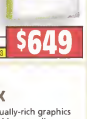
QuarkXPress 6.1 Patch Now Available

Quark XPress 6
$2530
Webserach WIN 224430
Webserach MAC 213305

Macromedia Dreamweaver MX 2004

A powerful combination of visual layout tools, application development features, and code editing support, enabling developers and designers at every skill level to create visually appealing, standards-based sites and applications quickly. From leading support for CSS-based design to hand-coding features, Dreamweaver provides the tools professionals need in an integrated, streamlined environment.

- Academic (210081) $185
- Upgrade (210066) $335



Full
Webserach WIN/MAC 209293
$649

Macromedia Flash MX Pro 2004

Improved rich media support, streamlined publishing and robust new features to jumpstart development of highly interactive experiences plus advanced functions for creating data-driven applications, interactive content, professional quality video experiences, and deployment to mobile phones and devices.

- Academic (209224) $265
- Upgrade (210072) $499
- Standard (209209) $810
- Standard Upg (210070) $330
- Standard Academic (209223) $185

Full
Webserach WIN/MAC 210071
$1135

Macromedia Fireworks MX 2004

Create, optimise and integrate great-looking web graphics. Fireworks MX 2004 provides professional control that enables easy creation of sophisticated rollover effects, multi-state buttons and pop-up menus. Fireworks MX 2004 streamlines productivity with enhanced performance and third-party web development tools.

- Academic (210082) $185
- Upgrade (210068) $268

Full
Webserach WIN/MAC 209097
$509

Macromedia Freehand MX

Concept and design visually-rich graphics for print and web with Macromedia FreeHand MX, the multi-publishing design solution with powerful illustration and drawing tools and an open, streamlined workflow.

- Upgrade from 10 $185
- Upgrade from 9 $255

Full
Webserach WIN 195298
Webserach MAC 195298
$590

Macromedia Director MX 2004

The proven multimedia tool for building rich, interactive content and applications for CDs, DVDs, kiosks, and the Internet. Director MX 2004 handles the widest variety of media, letting you build compelling, high-performance content—such as learning applications, corporate demonstrations, and games—that delivers measurable results.

- Academic (222698) $830
- Upgrade (214094) $655

Full
Webserach Code 214063
$1933

Macromedia ColdFusion MX 6.1

Easy connectivity to enterprise data, built-in connectivity for Flash user interfaces, integrated search and charting, and complete support for XML and web services, ColdFusion MX provides everything you need to deliver powerful applications. Available in a configuration that supports industry leading application servers.

- Standard (209258) $1678
- Standard Academic (209651) $1249

Enterprise
Webserach Code 198326
$7680

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CorelDRAW Graphics Suite 12
Streamline your workflow with one complete package

With new smart design tools, it's now easier and faster to produce more creative and accurate shapes and objects—giving you a more powerful Windows graphics suite. Discover new and advanced features that increase productivity, such as real-time visual feedback.
Keep your workflow smooth with industry-standard file compatibility, including SVG, AutoCAD, HPGL, Adobe Photoshop, Adobe Illustrator, PDF, and new Microsoft Office export. With integrated applications for vector drawing, page layout, digital imaging and motion graphics all in one box, CorelDRAW Graphics Suite 12 offers value that's second to none.

- Full (227046) $648
- Academic (213941) $155

Upgrade
Websearch Code 213940 **$290**

CorelDRAW Essentials 2
Create professional - looking designs - quickly and easily

A simple-to-use, all-in-one drawing application, with powerful photo-enhancement tools and customisable template capabilities that allow you to create professional-looking projects with ease. You can produce sophisticated graphics, correct and enhance photos, lay out your project and publish it in a variety of print and Web formats.

Features:

- CorelDRAW Essentials 2 - graphics and page layout
- Corel Photobook - photo retouching and editing
- Corel Photo-Album - photo albums and organising

Websearch Code 224412 **$129**

Corel WordPerfect Office 12
Ultimate power and control over documents

WordPerfect 12 delivers ultimate power and control over documents—allowing you to import and export MS Word files with enhanced ease and speed. Create professional-looking letters, articles, reports, proposals, books, legal pleadings, brochures and much more. In addition, WordPerfect 12 provides the advanced features and flexibility of HTML, Cascading Style Sheets (CSS), XML and PDF when publishing documents for distribution.

- Academic (223657) $159

Upgrade
Websearch Code 223656 **$239**

Full
Websearch Code 223655 **$449**

Corel KPT Collection
The best of Kai's Power Tools plug - in filters 5, 6 and Effects

The Corel KPT Collection of Kai's Power Tools plug-in filters gives professional designers an unprecedented set of creative tools. A natural addition to Adobe Photoshop , it dramatically extends the boundaries of image editing. KPT Fluid lets you create and animate a variety of distortions. KPT Ink Dropper creates liquids from water spots to smoky swirls. And KPT Lightning produces extremely realistic lightning effects. The whole collection makes a significant impact on your creativity and productivity.

Websearch Code 190908 **$169**

Corel Painter 8
The ultimate digital sketching and painting tool

Corel Painter 8 lets you experiment with the widest range of Natural-Media tools available today. Expand your digital painting technique with a portfolio of new features, including a Mixing Palette that realistically mimics the traditional paint mixing experience, digital Watercolour and Sketch effect, more than 325 new brushes and a Brush Creator for limitless customisation.

Massive Academic Price Drop

- Upgrade (196513) $242
- Academic (209941) $88

Websearch Code 240437 **$479**

Corel KnockOut 2
Complex masking with absolute precision

Corel KnockOut 2 dramatically increases the quality of your photo composites by letting you preserve fine image details that were once impossible to mask precisely.
Hair, smoke, shadows, water, transparencies and any blurred or out-of-focus edges can now be masked with incredible precision, speeding up the entire design process. Plus, Corel KnockOut 2 is an ideal plug-in for Adobe Photoshop, Corel PHOTO-PAINT or Corel Painter 8, so it fits seamlessly into your workflow.

Websearch Code 196910 **$179**

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Trellian eComm Store

With eComm, you can take orders 24 hours, 7 days a week, complete with secure order management and credit card processing (additional charges may apply). Secure online transactions and order management, build a detailed product database - images, freight, descriptions and more.

$52
Websearch Code 130908

Trellian Jack the MP3 Ripper

An efficient ripping tool that enables the user to extract audio from a CD and export the music into either .mp3 or .wav format.

- Encodes to MP3 or WAV
- Full editing and saving of MP3 format Title/Artist/ Trackname IDTAG information
- Requesting of Title/Artist/ Trackname data over the Internet

$66
Websearch Code 190113

Trellian SubmitWolf

Register your pages with over 1000 search engines and Directories in minutes. Post your links to over 500,000 link pages. Submit as many of your URLs as you like at no additional cost. 48 Hour, Priority Paid Submission on MSN, AOL, HotBot, GOTO, iWon, AltaVista, Slider.com and other sites part of the Inktomi network.

$176
Websearch Code 130006

Vet Net Surfer Anti-Virus

Do not leave virus protection to chance - purchase Vet Net Surfer now to automatically protect your PC from viruses, worms and trojans, including those arriving via email. Vet customers receive free unlimited phone and email support, as well as daily Virus Updates and free new versions - all for one year! All the anti-virus you need.

- Now automatically checks incoming email for viruses
- Suitable for a single home or business PC
- 100% made and supported in Australia
- Academic (223109) $39

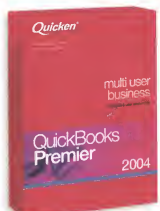
$75
Webasearch Code 223114

Vet Enterprise Anti-Virus

Do not leave your business unprotected from viruses, worms or trojans - purchase Vet Enterprise - small business edition now to protect 2, 5, 10 or 25 PCs. Install and update across networked PCs for maximum protection. And Vet customers receive free unlimited phone and email support, as well as daily Virus Updates and free new versions - all for one year!

- 100% made and supported in Australia
- 5 User (223046) $285
- 10 User (223081) $545
- 2 User Academic (223110) $59

2 User
$125
Webasearch Code 223080



QuickBooks Premier 2004

Powerful **5 User Accounting**.

QuickBooks Premier for up to 5 users includes comprehensive tools to meet your specialised needs: Premier includes versions for accountants, contractors, manufacturers & wholesalers, not for profit organisations, professional organisations, retailers or property managers

Features for 2004 Include:

- Share data among 5 simultaneous users - Allows up to five users to work on a QuickBooks company file at the same time
- Built specifically for your industry - QuickBooks is now available in many new industry-specific editions that offer specialised tools and features unique to your industry
- Multi Currency Accounting
- Increase efficiency with advanced tools - Save time and costs by emailing invoices, statements, estimates, purchase orders, sales orders, sales receipts, adjustment notes, and reports
- Complete control over your payroll - Calculate earnings, deductions, and payroll taxes from within QuickBooks
- Integrates seamlessly with Microsoft Office

5 User + ^12 months support
see pack for details

Go to www.csw.com.au quickbooks.asp to view red hot Quicken deals and prices!

^12 Months free support applies to full versions of QuickBooks Premier 2004 only.

Subscription	Upgrade	Full
Webasearch Code 223745	Webasearch Code 223676	Webasearch Code 223675
$460	**$615**	**$1295**

QuickBooks Pro 2004

Accounting, Inventory, Payroll and Time Management.

QuickBooks Pro lets you prepare quotes & estimates, integrates seamlessly with Microsoft Office and has advanced tools to help your increase efficiency and accuracy

Features for 2004 Include:

- Fully integrated Payroll contained wholly within QuickBooks
- Track Stock Assembly (finished goods)
- Units of Measure
- Sales order / back order tracking
- Multiple Quotes per job
- Variance tracking on Quotes
- Multi Currency Accounting
- Enhanced Electronic Banking*
- New bank reconciliation control allows you to reprint by any bank record date
- Single User, and much more...

**Check with your financial institution to see if they support this feature*

Integrates with Microsoft Office + ^12 months support
see pack for details

Go to www.csw.com.au quickbooks.asp to view red hot Quicken deals and prices!

^12 Months free support applies to full versions of QuickBooks Pro 2004 only.

Subscription	Upgrade	Full
Webasearch Code 223744	Webasearch Code 223677	Webasearch Code 223673
$230	**$289**	**$525**

QuickBooks Plus 2004

Accounting, Inventory + Payroll Management

QuickBooks Plus 2004 Small Business + Payroll accounting tools for a business with employees.

Features for 2004 Include:

- Fully integrated Payroll. Contained wholly within QuickBooks
- Print pay slips and cheques directly from QuickBooks Plus – now with improved layouts
- Electronic direct deposit of pay cheques
- Detailed reports and Payment Summaries
- Take care of all your Payroll and financial information in the one program
- Customisable – change the interface to the way you want it
- Single User

And much more...

Includes payroll

Go to www.csw.com.au quickbooks.asp to view red hot Quicken deals and prices!

Subscription	Upgrade	Full
Webasearch Code 223673	Webasearch Code 223676	Webasearch Code 223671
$185	**$229**	**$359**

CAN THE DEAL GET BETTER?
Call 1300 658 600 or visit www.csw.com.au as prices may change due to the daily fluctuations and online discounts.

1300 658 600

VISA MasterCard RENTSMART

QuickBooks Lite 2004

QuickBooks Lite 2004 is for you if you need an accounting solution that covers the essentials.

- Fast and easy start up
- Create invoices with one click
- Write and print cheques
- Track customer payments, expenses and liabilities

Features for 2004 include:

- Advanced options for backing up your data
- Automatically create a budget
- More form customisation options
- Download bank statements to QuickBooks^
- Single User

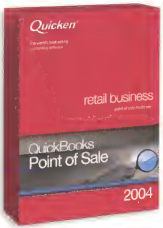
And much more...

^check with your financial institution to see if they support this feature

HOT PRICE!
Limited time only
Till 31st October

Go to www.csw.com.au quickbooks.asp to view red hot Quicken deals and prices!

Full
Websearch Code 223670 **$99**



QuickBooks Point of Sale 2004

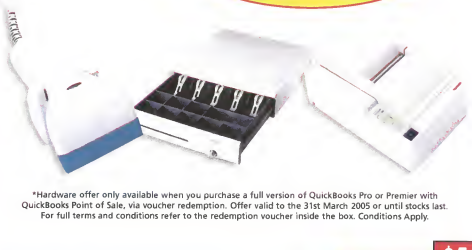
QuickBooks Point of Sale 2004 is for the retailer that is looking for a solution that delivers fast sales processing and easy customer management tools. QuickBooks Point of Sale requires QuickBooks to run, so to complete your store solution choose from QuickBooks Pro 2004 or QuickBooks Premier 2004 and take advantage of Premier's retail specific edition.

Features for 2004 include:

- Point of Sale enhancements to make installation even easier
- Point of Sale enhancements to make upgrades even easier
- Integration to QuickBooks Pro 2004, Premier 2004
- Point of sale for fast sales processing
- Customer account and lay-by management
- Touch screen enabled
- Extensive retail business management reports
- Bookkeeping done for you with link to QuickBooks Pro, Premier or Enterprise
- QuickBooks Point of Sale can be used with a wide range of point of sale hardware, including integrated EFTPOS options.

***$900 worth of hardware for FREE**

With every simultaneous purchase of QuickBooks Point of Sale full version and either QuickBooks Pro or QuickBooks Premier full version!



*Hardware offer only available when you purchase a full version of QuickBooks Pro or Premier with QuickBooks Point of Sale, via voucher redemption. Offer valid to the 31st March 2005 or until stocks last. For full terms and conditions refer to the redemption voucher inside the box. Conditions Apply.

Full
Websearch Code 223674 **$460**

OCTOBER/NOVEMBER 2004

Mannacom Publish PDF

Save virtually any document (from MS Word to complex graphs) in the popular Portable Document Format (PDF). A PDF file preserves the format of the original document, and contains all the original fonts, images & graphic information, layout and formatting – so what you see is exactly what everyone else sees. A PDF file can be viewed and printed from any computer running almost any operating system.

$88
Websearch Code 210633

Mannacom Publish PDF Pro

PublishPDF Pro has all the excellent features of the standard PublishPDF, but has extra security features to make it more suitable for sensitive information. Document security is increasingly important for companies the world over. PDF files, like other file formats, can be edited unless they are protected by encryption. Also included in PublishPDF Pro are other advanced features such as bookmarks and URL links.

$175
Websearch Code 210634

Dantz Retrospect Pro

Retrospect protects against loss due to viruses, newly installed software, user error, damaged hardware, hardware upgrades, hackers, and lost or stolen computers.

- **Small Business Server** (197430) **$1285**

$242
Websearch Code 197109

Australia's Software Specialist

StarOffice 7
By Sun Microsystems

Runs on Solaris, Linux and Windows. Read, write and edit Microsoft Office files. Applications include word processing, spreadsheets, presentations, database, drawing and graphics, web publishing and photo editing.

$149
Websearch Code 225214

Encyclopaedia Britannica 2004
Ultimate Reference Suite

With more than 100,000 articles, the Ultimate Reference Suite has more content than any other reference software! Three complete encyclopedias, two dictionaries and thesauruses, rich multimedia, a complete atlas, timelines, online magazines and more.

- Student (210960) $42
- Deluxe (210959) $73
- Ultimate Reference DVD (210962) $110

$110
Websearch Code 210961

Ipswitch WS_ FTP PRO

WS FTP Pro is the market leader in Windows-based FTP (file transfer protocol) client software. It enables users to move files between local and remote systems.

- Upload Wizard
- Auto Resume
- Custom Firewall Support with Editing Capability

$110
Websearch Code 196498

MYOB JustInvoices

If you are looking for a better way to prepare your invoices, track your sales and calculate GST received, but you are not after a complete business management system, MYOB JustInvoices is just what you need.

- Easily prepare and print quotes, invoices and statements
- Keep track of outstanding invoices
- Present professionally by designing your own invoice forms
- Keep on top of your GST obligations
- Improve your business by analysing your sales performance

$75
Websearch Code 223832

MYOB Accounting 14

MYOB Accounting is for businesses that need to streamline accounts procedures and would benefit from improved inventory management, better management of customer and supplier relationships and advanced business reporting.

- Manage your sales, receivables and GST obligations
- Track your purchases and payables
- Store all your business contacts' information
- Keep track of your inventory
- Analyse your business
- Access M-Powered Services

Full Version
$268
Websearch Code 223824

Upgrade
$220
Websearch Code 223826

MYOB Premier 8

MYOB Premier is for businesses that need to streamline accounts procedures, whether through simplifying complex inventory issues, running an automated payroll, time billing, accessing advanced reporting or increasing productivity with multi-user access.

- Multiple users can access your business information simultaneously over your network
- Includes FREE 12 months of support access and upgrades
- Integrated banking, sales, purchases, payroll and time billing
- Record and track foreign-currency transactions
- Powerful inventory and pricing features
- Access M-Powered Services

$1320
Websearch Code 223823

MYOB FirstEdge - for Mac

MYOB FirstEdge is the basic business management software solution for small or home-based businesses using a Mac, that helps you to work faster and more efficiently.

- Create quotes that convert to invoices
- Track job costings and profitability
- Track your GST and automate your BAS
- Create and customise over 70 reports
- Email quotes, invoices and reports

HOT PRICE!
Limited time only
Till 31st October

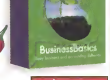
$99
Websearch Code 194241

MYOB BusinessBasics

No need to jump between programs (such as spreadsheets and word processors) to get your business done. Now with MYOB BusinessBasics, you can run all your basic business tasks, create quotes, email invoices and enter transactions - from the one easy business program.

MYOB BusinessBasics is ideal for small or home-based businesses, offering you a number of significant time-saving features that make business management even easier, such as:

- Automated bank reconciliation
- An easy-entry transaction register



HOT PRICE!
Limited time only
Till 31st October

$99
Websearch Code 213762

MYOB Accounting Plus 14

MYOB Accounting Plus is for businesses that need to streamline accounts procedures and would benefit from improved inventory management, better management of customer and supplier relationships, advanced business reporting and automated payroll or time billing.

- Handle all your staff's needs with an award-winning integrated payroll
- Bill for your time the way you want to
- Manage all your sales and purchases
- Analyse your business
- Access M-Powered Services

Full Version
$495
Websearch Code 223825

Upgrade
$259
Websearch Code 223833

MYOB RetailManager Standard

The complete retail picture. With MYOB RetailManager Standard it is easy to keep track of every transaction in your store from sales, stock movements, GST and gross profit, right through to staff actions and even customer details.

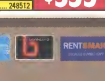
- Process sales fast
- Build powerful customer relationships
- Produce reports at point-of-sale
- Streamline your stocktaking
- Manage your stock
- RetailManager Enterprise (192167) $1705

$1650
Websearch Code 227037

MYOB AccountEdge 4 - for Mac

MYOB AccountEdge is the ideal accounting and business management software solution for businesses using a Mac.

- Track your inventory and your money
- Process your payroll
- Track your billable time
- Maintain accurate accounts
- Process sales and purchases
- Build better customer and supplier relationships
- Setup and manage promotions



$539
Websearch Code 248512

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Call 1300 658 600 or visit: www.cos.com.au
(a picture may change due to the daily fluctuations and online discounts.

1300 658 600

VISA MasterCard RENT&MAUT

Neoteck nbsPOS - Point of Sale solution

Neoteck Business Solutions bring you Australia's most affordable SQL based Point of Sale solution. nbsPOS is a powerful and easy to use point of sale solution for small single register businesses to large, multi-site organisations. With optional modules for pharmacy, hospitality and hiring, nbsPOS provides a complete retail solution.

FEATURES

- Easy Searching Of Customers, Stock & Suppliers
- Includes Smart Card reader/writer
- User Definable Toolbars & Shortcut Keys
- SQL Database
- Multiple Barcodes for each Product
- Lay-Bys & Gift Certificates
- Comprehensive Discount Options
- Comprehensive & customisable security features
- Stand-alone Customer Loyalty program
- Detailed Reporting & Audit Trails
- Kits & Serial Number Tracking
- Process Multiple Sales
- Split Tenders & Multiple Tender Methods

SUPPORTED PERIPHERALS

nbsPOS is compatible with most computer based point of sale hardware, including:

- Touch Screens
- Strip Printers
- Customer Pole Displays
- EFTPOS Terminals
- Barcode Scanners
- Electronic Cash Drawers
- Programmable Keyboards

OPTIONAL EXTRAS

nbsPOS is easily upgraded from the standard single user version. nbsPOS may be simply upgraded to the multi-user nbsPOS for enterprise by simply purchasing the additional user licenses.

Optional add-on modules include:

nbsPOS for Pharmacy

With a real-time link to FRED pharmacy dispensary and standard hire functionality included.

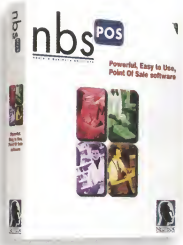
nbsHOST

The hospitality management solution allows you to manage your restaurant's tables, menus, meal orders, functions and sales.

nbsHIRE

The hire management system has been design specifically to suit the needs of any business that needs to hire out items.

Contact Neoteck Business Solutions at www.neoteck.com.au for more information on these optional extras.



Websearch Code 227065 **$995**

Crystal Reports 10

Standard Edition

Designed for access to data stored in personal data sources and the creation of highly formatted reports, Crystal Reports 10 Standard is an intuitive solution that provides basic report design functionality off PC-based data sources.

Professional Edition

Designed for the creation and maintenance of highly formatted reports, Crystal Reports 10 Professional is a high productivity solution that includes all features in the Standard Edition plus access to almost any enterprise data source.

New! Crystal Enterprise 10 Express: Crystal Enterprise Express is an out of the box client access report delivery system which enables you to manage, secure and schedule your Crystal Reports over the Web. It includes a report publisher and Web portal interface and is ideal for reducing the overhead of delivering reports to small groups and departments. 5 named user deployment licenses of Crystal Enterprise Express are included with Crystal Reports 10 Professional edition. Additional Crystal Enterprise Express named user licenses are available.

Developer Edition

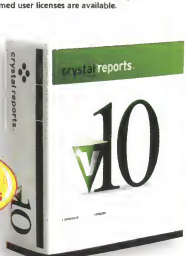
Designed for easily integrating report viewing, printing and exporting capabilities into applications, Crystal Reports 10 Developer provides both report design and developer tools for integrating reports into applications

Advanced Developer Edition

Designed for formatting and integrating interactive data within web applications, Crystal Reports 10 Advanced Developer offers a web development and deployment bundle for integrating and deploying dynamic report creation and viewing capabilities into web applications. It includes the complete Crystal Reports feature set and an introductory offer of Crystal Enterprise Embedded Edition for offloaded report processing and runtime report creation.

- **Developer Upgrade** (214409) $363
- **Advanced Developer Upgrade** (214475) $1895
- **Professional Upgrade** (214477) $289
- **Analysis Professional Upgrade** (222139) $275
- **Enterprise Express** (249729) $660

Crystal Enterprise Express Additional Named User licenses Available



Analysis Professional	Standard Edition	Professional Edition	Developer Edition	Advanced Developer Edition
$515	$225	$559	$685	$2310
Websearch Code 222138	Websearch Code 214478	Websearch Code 214286	Websearch Code 214476	Websearch Code 214474

WinZip 9

The archive utility for Windows and the ultimate companion for Internet downloading. Zipping safely compresses the data in your files, so that your files then occupy less space, allowing you send and save more! Multi-user licenses available.

Picture for illustration purposes only

$79

Websearch Code 223036

Microsoft Flight Simulator 2004

A Century of Flight celebrates the first 100 years of powered flight with a collection of important historical aircraft and exciting new features that continue the traditions of realism, technological innovation, and richness that have delighted aviation enthusiasts and pilots around the world.

- **Combat Flight Simulator 3 (248646)** $55

$88

Websearch Code 197573

Executive Software Diskeeper 8.0

Maximize and maintain system performance automatically. The only way to maximise system speed is to eliminate fragmentation entirely - something that a manual defragmenter simply can not do.

- **Home Edition (210358)** $65

Professional Edition
$119
Websearch 210359

Centennial Media Training for FileMaker Pro 7

Providing thorough and comprehensive training into the principles and features of FileMaker Pro 7. Proceed step by step with easy to understand methods and techniques.

Basic
$231
Websearch Code 246701

Advanced
$231
Websearch Code 246702

TypeSmart

TypeSmart can take beginner or "hunt and peck" typists to 10 finger touch typing in just 6 hours.

TypeSmart justifies its tagline "Breakthrough Typing Tutor" by dispensing with the outdated Home Keys method and introducing the eText Direct Reach Method recommended by the latest research into modern typing. It is the only typing software to do so and is now established in many of Australia's leading private schools, Australia's largest provider of distance learning, Deakin University, and is now being actively promoted into the TAFE and training environments.

$75
Websearch Code 210189

FileMaker Pro 7

Simply the best way to manage your data

FileMaker Pro 7 is the easiest-to-use, most customisable database software that effortlessly manages all your information. Gain insights into your business so you can make more informed decisions and enhance productivity.

With over 100 new and improved features, you can turn your ideas into creative and customised solutions, tailor them to solve your specific business problems and share them securely with your whole workgroup.

FileMaker Pro 7's enhanced productivity tools allow you to:

- Organise all your data: PDFs, images, video, presentations, Excel and Word documents.
- Develop document management systems to track and archive workgroup data.
- Solve problems immediately with 30 free starter solutions for business, education and home.
- Create fully relational database solutions quickly.
- Link your data with the new intuitive relationships graph.
- Exchange data with Microsoft Office and many other applications.
- Develop and distribute secure business solutions over your networks or through single-click Web publishing.
- Control access through a unified accounts and privileges security model.

 # 1-selling easy-to-use database just got better!

New features include:

- Store ANY file type in FileMaker Pro 7
- Visual tool for managing relationships
- Multiple views in different windows
- New security model – Data protection
- Multiple tables per file
- Improved Instant Web Publishing

SPECIAL UPGRADE OFFER!
For a limited time, ALL customers who own a licence of FileMaker Pro 2.1, 3.0, 4.x, 5.x and 6 can upgrade to FileMaker Pro 7 until 17/9/2004**

*The FileMaker 7 product family does not work with earlier versions of FileMaker products.
**Offer expires on 17/9/2004 for FileMaker Pro 2.1, 3.0, 4.x, and 5.x licensed users.
Go to www.filemaker.com.au/upgrade for more information.

Full	Upgrade	5 User	5 User Upgrade	Academic	5 User Academic
$458	**$229**	**$2249**	**$1133**	**$239**	**$1188**
Websearch Code ...222368	Websearch Code ...222369	Websearch Code ...222369	Websearch Code ...222370	Websearch Code ...223582	Websearch Code ...222465

FileMaker Server 7

FileMaker Server 7 is high-performance server software that efficiently manages shared database solutions.

With ease of use breakthroughs in sharing and administration, as well as advanced security options, FileMaker Server 7 delivers powerful, yet easy to use features you can use to:

- Share databases with up to 250 users
- Host virtually unlimited amounts of data
- Administer databases centrally or remotely
- Improve the performance of shared databases
- Protect your data with advanced security features.
- Upgrade (224954) $849
- Academic (224962) $875

NEW

Websearch Code 224962 **$1650**

Buy the FileMaker Licensing Starter Pack and Save!

Purchase FileMaker's Licensing Starter Pack, which includes four FileMaker Pro 7 licences and one licence each of FileMaker Developer 7 and FileMaker Server 7, plus 12 months upgrade maintenance for AUD$4,250 (inc GST) and save AUD$370. Future purchases of upgrades or new licences will be available at the discounted VLA price.
Save now. Save in the future. This offer starts on July 21, 2004 and ends on December 23, 2004. Education and Upgrade pricing is also available. For further details go to http://www.filemaker.com.au/promos

NEW

Save now. Save in the future.

Websearch Code 248878 **$4250**

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Call 1300 658 600 or visit www.ceo.com.au
as prices may change due to the daily fluctuations and online discounts.

1300 658 600

VISA MasterCard RENTSMART

ACT! 6

The best-selling contact manager. Manage information in ACT!—then have it appear in Microsoft Outlook, Palm OS or Pocket PC handhelds on the Web, or in your paper planner. That's the power of ACT!—the ONE place where you can manage every detail of your customer relationship.

- Schedule unlimited calls, meetings and to-do items.
- Create and send personalised letters, faxes, and html e-mails.
- Manage your sales pipeline with forecasting tools and built-in reports.
- Share complete customer information with other staff members in your office.
- Easily synchronise your information to your Palm OS or Pocket PC* device.
- Integrates with popular accounting software* such as MYOB Accounting, QuickBooks and Sage Line 50/ 100
- Integrates with Microsoft Word and Excel and Outlook

Pocket PC and Accounting integration software sold separately.

Buy ACT! 6 now and get the next version FREE!*

* SPECIAL OFFER. Buy ACT! 6 or an ACT! 6 Pack between 1 July 2004 and 30 September 2004 and you will be entitled to receive the next equivalent version free. Offer excludes ACT! Corporate license, Upgrades, Academic and Government Non Profit purchases. The terms and conditions and redemption claim form are available at www.act.com/freeupgrade. Proof of purchase must be provided. Redemption costs apply.

ACT Single User — Websearch Code ..... 191976 — **$229**

ACT 6 Pack — Websearch Code ..... 191974 — **$1175**

ACT! 6.0, Palm OS and Pocket PC Bonus Pack

The latest product to hit the ACT! product range is the ACT!, Palm OS and Pocket PC Bonus Pack:

- Now you can by ACT!, ACT! for Palm OS and the ACT! Link for Pocket PC all in one package
- ACT! v6.0- the best-selling, user friendly contact manager on the market!
- ACT! for Palm OS- Have complete customer information with you on-the-go. ACT! for Palm OS is the first-ever, complete contact for Palm OS handhelds.
- ACT! Link for Pocket PC- synchronise your contacts and appointments to your Pocket PC handheld.
- ACT! 6.0, Palm OS (194991) $69

Websearch Code ..... 224407 — **$249**

ACT! For Web

ACT! also has a web version that is powerful and easy-to-use. ACT! for Web is a contact manager for the web, designed for corporate users and workgroups.

- Remote ACT! for Web users can share realtime information with other users back in the office.
- Administrators can easily customise database screens without programming or HTML and assign specific security rights to individual users.

ACT For Web — Websearch Code ..... 205441 — **$299**

MAUS Stockmarket Plus 5

MAUS Stockmarket Plus is a comprehensive, yet simple to use portfolio management tool that allows you to keep track of your investments and make informed and profitable investment decisions.
The software generates instant profit & loss reports, allows you to test the profitability of different investment opportunities and even provide a tax assessment of your investments!

Websearch Code ..... 191498 — **$176**

MAUS Performance Review

Document ongoing staff performance and save time and money in creating personalised, grammatically correct performance reviews. Simply choose from dozens of performance criteria to suit the position, use the simple grading system to rate your employee in each area and MAUS Performance Review will automatically support your ratings with clear, effective text.

Websearch Code ..... 189762 — **$264**

MAUS Job Descriptions

Create a detailed outline of employee responsibilities and roles, educational requirements, work environment and even necessary job knowledge in minutes with MAUS Job Descriptions.
This innovative and easy to use software comes complete with a library of over 3,800 customisable position descriptions. Give your employees the information they need to maintain focus and work smarter!

Websearch Code ..... 191674 — **$264**

MAUS Employee Manual

Use the simple question and answer format to create a comprehensive, plain English employee handbook that covers everything from payment of wages & standards of conduct through to training & termination procedures.
MAUS Employee Manual will ensure you have productive and motivated staff whilst protecting your business from costly litigation such as unfair dismissal!

- Enterprise (223854) $440

Professional — Websearch Code ..... MAU011 — **$198**

MAUS Policies Manual

Develop a complete operations handbook that incorporates procedures, workflow documents and business forms into one comprehensive reference manual with MAUS Policies Manual. This innovative software will allow you to quickly and simply create a handbook that is specific to your business, not just a collection of standardised policies and procedures.

Websearch Code ..... 223859 — **$249**

MAUS MasterPlan

MasterPlan allows you to develop Business and Marketing Plans, complete with a full set of financials, actual vs. budgeted comparisons and graphical analysis. Designed for people who need a professional plan with a minimum of fuss, the software uses a simple question and answer format, complete with sample text to lead you through the entire planning process.

- Enterprise (223857) $449

Professional — Websearch Code ..... 223853 — **$249**

Dragon Naturally Speaking 7 Standard

Simply talk to your computer and your words instantly appear. Launch programs, create, edit and format documents, and manage the desktop - all by voice! Includes headset microphone.

- Essentials (207885) $106

Websearch Code ..... 196420 — **$182**

Dragon Naturally Speaking 7 Preferred

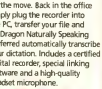
After completing about 5 minutes of training, you can talk to your computer and watch your words instantly appear in virtually any Windows based application. Create Reports, spreadsheets and business letters - at up to 160 words-per-minute!

- Preferred Upgrade (196419) $186
- Professional (207884) $1,585
- Pro Upgrade (207883) $499

Websearch Code ..... 197400 — **$349**

Dragon Naturally Speaking 7 Mobile

Dictate documents and notes on the move. Back in the office simply plug the recorder into the PC, transfer your file and let Dragon Naturally Speaking Preferred automatically transcribe your dictation. Includes a certified digital recorder, special linking software and a high-quality headset microphone.



Websearch Code ..... 210772 — **$536**

Symantec FireWall VPN Appliance

Model 100 - 4 Lan and 1 Wan Ports
Provides plug and play networking, web access, and firewall and VPN security for up to 25 users.
(189887) $475

Model 200 - 8 Lan and 2 Wan Ports
Brings Firewall and VPN protection, load balancing, and high availability to offices with up to 40 users
(189888) $599

Model 200R - 8 Lan and 2 Wan Ports
Brings Firewall and VPN protection, load balancing, and high availability to offices with up to 40 users. Also includes the Symantec VPN Client (with integrated personal firewall).
(189889) $770

All-in-One Security and Networking

Symantec Gateway Security 360R

The Symantec Gateway Security 300 Series is high-performance, low-maintenance firewall appliance for small businesses. It combines comprehensive security, a reliable Internet gateway, and a secure wireless LAN option in one affordable solution. Its intuitive installation wizard and exclusive LiveUpdate technology make setup and maintenance a breeze, while its licensing options eliminate the hassle and cost of monthly subscription charges.

- Symantec Gateway Security 300 Wireless LAN Add-on (248550) $249

Powerful firewall protection for your business network

$552
Websearch Code 248835

Norton Internet Security 2004

Symantec's Norton Internet Security 2004 provides essential protection from viruses, hackers, and privacy threats. Powerful yet easy to use, this award-winning suite now includes advanced spam-fighting software to filter unwanted mail out of your inbox. Protect yourself, your family, and your PC online with Norton Internet Security 2004.

Norton Internet Security 2004 includes:
- Norton AntiVirus
- Norton Personal Firewall
- Norton Privacy Control
- Norton AntiSpam
- Norton Parental Control

- **Academic** (210240) $77
- **Norton Internet Security Pro** (210637) $138
- **Norton Internet Security 5 User** (210648) $339

$30 MAIL-IN UPGRADE REBATE*

***$30 MAIL-IN UPGRADE REBATE OFFER!**
The upgrade rebate offer is valid for stand alone, full version, retail packaged purchases of Norton Internet Security 2004 or Norton SystemWorks 2004 or Norton Internet Security 2004 Professional or Norton SystemWorks 2004 Professional made until December 31, 2004. Offer not valid with purchases of trade-ups, site licences, electronic software downloads, academic, trialware, NFR's, auction purchases, Multi-user Packs, OEM, and/or specially priced products. Offer is not valid in conjunction with any other rebate offer. No products purchased at an upgrade price will qualify. Offer not available to purchases made through the Symantec Upgrade Centre. Offer not available to OEM manufacturers or resellers. Offer is limited to one claim per purchase.

$118
Websearch Code 210636

Norton AntiVirus 2004

Symantec's Norton AntiVirus 2004 is the world's most trusted antivirus solution. It protects email, instant messages, and other files by automatically removing viruses, worms and Trojan horses. New built-in features also detect certain non-virus threats such as spyware and keystroke loggers. Protect your PC 24 hours a day with award-winning Norton AntiVirus.

- **5 User Pack** (210226) $222
- **10 User Pack** (210228) $429
- **1 User Academic** (210234) $52

$77
Websearch Code 210225

Norton AntiSpam 2004

Symantec's Norton AntiSpam 2004 filters unwanted email out of your inbox. Working with any POP3 email program, it filters incoming mail on multiple levels, detecting and flagging unsolicited messages while promptly delivering valid mail. To make your online time more enjoyable, Norton AntiSpam also blocks intrusive pop-up and banner ads.

- **5 User** (210650) $183
- **10 User** (210252) $365
- **Academic** (210238) $44

$63
Websearch Code 210645

Norton Personal Firewall 2004

Symantec's Norton Personal Firewall 2004 keeps hackers out and personal data in. It makes robust firewall protection easy by automatically hiding your PC on the Internet and blocking suspicious connections. Norton Personal Firewall also protects your privacy by preventing confidential information from being sent out without your knowledge.

- **5 User Pack** (210651) $225
- **10 User Pack** (210254) $444
- **Academic** (210244) $52

$77
Websearch Code 210644

Norton SystemWorks 2004

The smartest way to solve computer problems. This easy-to-use suite includes full versions of Symantec products to defend against viruses, optimise hard disks, manage your passwords, recover from system problems and clean up after Internet sessions.
Keep your PC running at its best with Norton SystemWorks.

- **Academic** (210247) $76

$117
Websearch Code 210638

Norton SystemWorks Pro 2004

Symantec's Norton SystemWorks 2004 Professional Edition provides advanced problem-solving solutions to maximize PC performance. Includes award-winning Symantec products and valuable additional utilities to protect your PC from viruses, optimise performance, diagnose and fix problems and recover from disasters.

- **5 User Pro** (210649) $345
- **10 User Pro** (210255) $677
- **Academic** (210248) $90

$137
Websearch Code 210646

Norton Password Manager 2004

Norton Password Manager records user names, passwords, credit card numbers, and other confidential information into an encrypted file that only you can access. Then it automatically offers to insert the appropriate data wherever you run a password-protected application (such as your email program) or visit a secure Web site.

- **Academic** (210251) $40

$62
Websearch Code 210647

Symantec AntiVirus 9.0 Business Packs

Provide powerful, easy-to-manage protection -automatically removing viruses, worms, and Trojan horses from your desktops and network servers, delivering timely updates, and defending your business against known and emerging threats.

- **10 User** (246368) $749
- **5 User with Groupware** (246378) $549
- **10 User with Groupware** (246486) $988

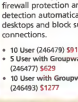
NEW

$399
5 User
Websearch Code 227023

Symantec Client Security 2.0 Business Packs

Provide powerful, multi-layer security in one easy-to-manage solution. With Symantec defending your business, you can count on up-to-date protection against viruses, hackers, and blended threats, along with world-class support. Cutting-edge firewall protection and intrusion detection automatically hide your desktops and block suspicious connections.

- **10 User** (246479) $919
- **5 User with Groupware** (246477) $629
- **10 User with Groupware** (246493) $1277



NEW

$497
5 User
Websearch Code 246480

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Call 1300 658 600 or visit: www.ozsa.com.au
as prices may change due to the daily fluctuations and online discounts.

1300 658 600

VISA MasterCard RENTSMART www.rentsmart.com

Disk Management, Rollback Utility & Data Protection

Which is right for you?

Use this handy table below to compare our disk management solutions.

Easily organise your hard drive with Norton PartitionMagic 8

Key Features	Norton Partition Magic 8.0	Norton GoBack 4.0	Norton Ghost 9.0
Create, resize, and copy partitions	•		
Run multiple operating systems safely	•		
Automatically track every change to your PC		•	
Undo overwritten versions of a file		•	
Protect valuable files from computer disasters		•	•
Create an exact copy of everything on your PC for emergencies			•
Backup to virtually any CD, DVD, or external drive			•
Downloads updates automatically			•

The Symantec V2i Protector Family

Server & Desktop Editions

Symantec V2i Protector is a real-time, disk-based system and storage backup solution designed to capture and encapsulate all server or desktop files and configurations in one easy-to-manage backup file. Backups can be saved to a SAN, NAS, RAID, or CD/DVD without interrupting user productivity or application usage.

Quickly restore failed systems to a specified point-in-time without taking hours to manually rebuild and restore data from tape backup. Using V2i Protector, you can perform a full system restoration, a complete bare metal restoration, or restore individual files and folders in minutes.

- **Symantec V2i Protector Server Edition Licensing Bundle** (246639) $1760

V2i TECHNOLOGY

Backup and protect Windows 2000 Professional and XP Professional workstations

Desktop Edition
$143
Websearch Code 248472

Symantec Norton GoBack 4

Symantec's Norton GoBack 4.0 allows you to easily undo PC problems. Restore your PC to a healthy state by going back minutes, hours, or even days (depending on available disk space). Or you can use it to recover individual files and folders, such as accidentally deleted files and previous versions of documents. The new SafeTry Mode makes it easy to recover from problematic software installations.

- **Academic**
  Also available

Call for Pricing

Symantec Norton Ghost 9.0

Symantec's Norton Ghost 9.0 provides advanced backup and recovery for your PC. Protect your data by making a backup of your hard drive's contents - without restarting Windows. Incremental backups save you time and disk space. You can even schedule backups to run automatically. Quickly restore individual files, selected folders, or the entire hard drive.

- **Academic**
  Also available

Call for Pricing

Norton Partition Magic 8

Symantec's Norton PartitionMagic 8.0 lets you easily organize your hard drive by creating, resizing, copying, and merging disk partitions. Separate your operating system, applications, documents, music, photos, games, and backup files to reduce the risk of data loss if your system crashes. You can use Norton PartitionMagic 8.0 to run multiple operating systems safely.

- **Academic**
  (226040) $66

Websearch Code 226037 **$88**

Symantec pcAnywhere 11.0

Combines secure, industry-leading remote control with remote management and advanced file transfer to help IT personnel quickly resolve helpdesk and server support problems. Offers comprehensive security, including support for 13 authentication types. Advanced security with 13 different authentication methods including RSA SecurID.

- **Academic**
  (197449) $165
- **Host only**
  (197447) $159

Host & Remote
Websearch Code 197446 **$245**

Symantec pcAnywhere 11.0 5 User

Symantec's pcAnywhere 11.0 is the world's leading remote control solution. Its integrated tools make it easy for helpdesk personnel to resolve server and workstation problems. Robust security prevents unauthorized access to enterprise resources. File transfer users will appreciate the ability to queue multiple files and then work uninterrupted while the files are transferring.
Package includes 1 CD, 1 Remote Licence and 5 Host Licences

- **Academic**
  (222981) $315

5 User
Websearch Code 197448 **$525**

Drive Image 7

Drive Image 7.0 Backup is a premier computer backup solution, protecting all your valuable data and providing peace of mind. Easily backup everything on your computer: priceless digital photos, important financial records, your operating system and all of your important programs and settings without ever leaving Windows. Save valuable time by scheduling automatic backups.

HOT PRICE!
Limited time only while stocks last!

Websearch Code 246378 **$88**

Australia's Software Specialist

ACDSee Photo Master Suite

ACDSee Photo Master Suite combines Corel PHOTO-PAINT 11 photo editing software, with ACD FotoSlate7 2.0 printing software and ACD mPower Tools1 multimedia software. Fix photos fast and create amazing graphics for print and web. Print professional-quality photos in three easy steps. Organise and find files easily.

Includes full version of Corel PhotoPaint 11

$169

Webcsearch Code 209556

ACDSee Deluxe 6

ACDSee digital photo software makes it easy to import, view, organise, print, enhance, share and archive your digital photos. ACDSee is easy to use for everyone from beginner to professional level and also powerful and flexible enough to meet your needs as your image collection grows.

$88

Webcsearch Code 211069

ACDSee PowerPack Deluxe 6

Includes:

ACDSee 6.0 Deluxe - Your Digital Photo Software and Picture Viewer

ACD FotoCanvas - Your Easy and Affordable Photo Editor

ACD FotoSlate - Your Fast and Creative Photo Printing Software

$132

Webcsearch Code 211565

Roxio Creator 7

Roxio Creator 7 is the all-in-one, award-winning solution for your digital media. Including fully integrated applications Easy CD&DVD, PhotoSuite 7 Platinum and VideoWave 7 Pro. Advanced tools and automated features allow beginner or expert to capture, edit, enhance and burn professional photo, video, music and data projects quickly and easily.

NEW

$135

Webcsearch Code 223844

Roxio Toast 6 Titanium

New Toast 6 Titanium is the standard for CD & DVD burning on Mac OS X. Secure your important data; digitise old records; turn still photos into stunning media shows with Hollywood-style special effects; make video discs automatically from your DV camcorder. Burn VCDs, SVCDs, and DVDs with menus. Toast 6 is the essential foundation for your digital life! Get more out of your iLife - Roxio Toast 6 helps you do even more with iTunes, iPhoto, iMovie and GarageBand!

$128

Webcsearch Code 210126

Roxio Toast with Jam 6

Make your Toast sing with Jam. Toast with Jam delivers the full CD and DVD burning power of Toast plus pro audio editing and mastering for Mac. Produce commercial CDs and demos with impeccable quality. Import your favorite file formats, tweak your music with Bias Peak LE TM VST TM, arrange your tracks and burn a glass master.

$319

Webcsearch Code 249754

Roxio Photosuite 7 Platinum

Professional photo editing made easy. Instantly correct common photo problems and transform ordinary photos into personal masterpieces. Create stunning projects like calendars or holiday cards with point-and-click ease. Preserve a lifetime of precious memories on CD and share them in the comfort of your living room. The new PhotoSuite 7 Platinum - Simply Picture Perfect.

NEW

$88

Webcsearch Code 223845

Roxio VideoWave 7 Professional

Roxio VideoWave 7 Professional makes it easy to edit and produce Hollywood-style videos complete with music, transitions, special effects, text credits and theater-rich Dolby Digital sound. Author and burn professional-quality DVDs with animated menus and resizable buttons. VideoWave 7 Professional — the only video editing software you need.

NEW

$110

Webcsearch Code 223846

Nero 6

All of your CD and DVD burning tasks can be managed in a breeze with Nero 6. Burning DVD video, photo, data, audio or backup Nero handles all the possibilities with ease. Included within the burning solution, you can edit audio, mix multiple audio tracks like recording studio professionals, watch VCD, SVCD and DVD movies, listen to music, design covers, optimise your drive's performance and more.

$165

Webcsearch Code 208952

Sony Vegas5 & Vegas+DVD

With powerful video and audio production tools, Vegas software provides a complete and integrated solution for digital video, audio recording, editing and mixing, streaming content creation and surround sound production.

- Vegas+DVD full (225149) $1149
- Vegas 5 upgrade (246568) $255
- Vegas+DVD upgrade (224184) $396

Red Hot Upgrade Offer

Vegas 5

$726

Webcsearch Code 233770

Sony ACID Pro 4.0

Award-winning loop-based music creation tool that allows professionals to produce original, royalty-free music. Use ACID Pro software to create your own songs, remix those tracks, produce 5.1 surround audio mixes, develop music beds, score your own videos and create music for web sites and Flash(tm) animations. Work with a huge assortment of loops in multiple genres. ACID Pro software lets users compose using unlimited tracks of audio and MIDI, import and Beatmap complete songs.

$574

Webcsearch Code 223016

Sony Sound Forge 7.0

Sound Forge software is an award-winning digital audio editor that includes a powerful set of audio processes tools, and effects for recording and manipulating audio. This industry-standard application is the professional's choice for audio editing, audio recording, effects processing, streaming content creation, and more.

$619

Webcsearch Code 211723

Sony Vegas Movie Studio+DVD

Vegas Movie Studio and DVD Architect Studio software provide you with a powerful, integrated and easy-to-use set of features that lets you bring your collection of videos, digital photos and music to life. Includes interactive tutorials. Use DVD Architect Studio software to burn your creations to DVD, produce movies containing multiple menus, buttons and links, or create slideshows and music compilations.

NEW

$220

Webcsearch Code 249728

Sony ACID Music Studio 5

Turn your PC into a music creation studio! Built-on award-winning ACID software technology, ACID Music Studio software provides all the tools you need to create your own music, remixes, soundtracks and CDs. Simply select from over 1,000 professionally recorded music loops in multiple genres and instrumentation, paint them into the tracks, and play them back. ACID Music Studio software automatically matches the tempo and musical elements so everything plays back together and sounds great.

NEW

$209

Webcsearch Code 249215

Sony Sound Forge Audio Studio 7

Turn your PC into an audio recording and editing studio! Sound Forge Audio Studio software provides all the tools you need to record your own music, edit audio, create streaming media and burn songs to CD. Capture live recordings of your music, instruments or vocal performance, or import music from your own CDs. Edit audio in over 10 popular formats. Apply over 30 built-in effects such as EQ, Reverb, and Delay.

NEW

$220

Webcsearch Code 249216

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Call 1300 658 600 or visit: www.cbm.com.au
as prices may change due to the daily fluctuations and online discounts.

1300 658 600

VISA MasterCard RENTSMART

Pinnacle Instant Copy 8

Make copies of your DVDs and CDs faster and easier than ever. Featuring a friendly interface and revolutionary duplication technology, Pinnacle Instant Copy burns bit-for-bit CD and DVD copies at unbeatable speeds! It's the smart way to make true 1:1 copies of DVD movies, transfer DVD content to Video CDs, and backup any CD media, including data, music, and video discs.

Websearch Code 210229 **$88**

Pinnacle Instant CD/DVD

With drag and drop simplicity, Pinnacle Systems InstantCD/DVD software accomplishes all the tasks associated with a disc burning project. It encodes MP3 files, burns audio CDs, duplicates CDs and DVDs, backs up data, and even creates photo and video slideshows that can be viewed on practically any home DVD player.

Websearch Code 210230 **$139**

Pinnacle Instant VideoAlbum

Preserve and share all of your taped home videos onto DVD with Pinnacle Instant VideoAlbum. Instant VideoAlbum is designed to provide the highest quality results with the lowest possible learning curve. The software includes tools for trimming unwanted video and improving poorly lit shots.

Websearch Code 211290 **$88**

Jasc Paintshop Photo Album 5

Paint Shop Photo Album is simply the easiest way to do more with your digital photos. Now you can organize, fix, share, and protect photos with one easy-to-use tool. Finally, the digital camera software you've been waiting for is here.

$85

Websearch Code 248887

Pinnacle Instant PhotoAlbum

Quickly organise your digital photos and video clips into interactive, high-resolution slideshows, burn them onto CD or DVD and watch them on your TV with Instant PhotoAlbum. Instant PhotoAlbum quickly turns your photos into exciting productions that you can share and enjoy with friends and family for years to come.

Websearch Code 211291 **$66**

Steinberg Clean 5

Clean up those dirty, poorly compressed recordings with Steinberg CLEAN, the all-in-one audio restoration and CD burning solution. Developed by Steinberg, CLEAN breathes new life into your vintage vinyl, old cassettes and questionable MP3 files.

Websearch Code 211392 **$90**

Steinberg Clean Plus 5

Steinberg Clean Plus uses today's leading-edge audio restoration technologies to remove unwanted pops, clicks, hiss and hum from your old vinyl LPs and cassettes, leaving your tracks sounding as good as the day you bought them. It's the perfect tool for archiving and preserving your entire music library.

Includes PRE-AMP

Websearch Code 211391 **$220**

Jasc PaintShop Pro 8

Not only have your favourite photo editing and graphic design tools been improved, there's a whole array of new ones. Plus, there's a brand-new integrated learning system that's easier to use than ever before.

- **Upgrade** (196525) $125
- **Academic** (196526) $165

$215

Websearch Code 196309

Steinberg Cubasis VST 5

Create original compositions like the pros quickly and easily with STEINBERG CUBASIS VST version 5. The software features up to 48 audio channels, 64 MIDI tracks, a professional mixer with real-time effects and a huge variety of virtual instruments. Compose songs, edit sounds, print your scores and burn CDs with surround sound.

Websearch Code 214687 **$215**

Ulead PhotoImpact XL

PhotoImpact XL gives you the most innovative image editing tools for the PC. Edit, manage and share digital photos, plus so much more. More digital photography tools, more filters and effects, more content and more learning resources. It's everything you need to produce professional results fast.

- **Upgrade** (210124) $98

$20 Cashback Offer*

*Offer ends 30th Sept 2004. Terms and conditions apply.

Websearch Code 210125 **$158**

Ulead My Scrapbook 2

Everything you need to create scrapbook pages, background paper, clip art and titles on your computer. Customise and print a variety of scrapbook-themed pages and background paper to 8.5"x11" or 12"x12" format. Improve not-so-great photos with commonly used photo-editing tools. It's your complete scrapbooking software.

NEW

$10 Cashback Offer*

*Offer ends 30th Sept 2004. Terms and conditions apply.

Websearch Code 246573 **$44**

Jasc Paint Shop Power Suite

Includes Paint Shop Pro 8 Complete photo and graphics editor; Paint Shop Photo Album Enhance, Paint Shop Xtras Edition 1 and 2 - Ready-to-use artistic resources; Animation Shop - GIF animation on the web; plus free learning tools.

$239

Websearch Code 212742

Ulead DVD Picture Show 2

The ideal companion for your digital camera, combining two powerful programs for managing your photos and creating exciting multimedia slideshows that play on your DVD player, includes new PhotoExplorer 8.

NEW

$10 Cashback Offer*

*Offer ends 30th Sept 2004. Terms and conditions apply.

Websearch Code 248342 **$88**

Ulead DVD Movie Factory 3

Ulead DVD MovieFactory 3 Disc Creator is a whole new world of CD and DVD making. Burn movies, slideshows, data and music to CD or DVD in an instant.

- **Upgrade** (214049) $145
- **Academic** (214050) $145

$20 Cashback Offer*

*Offer ends 30th Sept 2004. Terms and conditions apply.

Websearch Code 214049 **$165**

Ulead Video Studio 8

If you've never edited a movie before, make one in three easy steps using the new Movie Wizard mode. Share finished projects on DVD, tape, the Web, and mobile devices. Unmatched stability, high-speed rendering and real-time performance mean less waiting and more time for creating.

- **Upgrade** (224056) $99
- **Academic** (224057) $115

NEW

$20 Cashback Offer*

*Offer ends 30th Sept 2004. Terms and conditions apply.

Websearch Code 224055 **$180**

HARDWARE • SOFTWARE • COMPATIBILITY
The Microsoft® Advantage

Microsoft
innovation that matters

NEW Hardware Range for 2004

Microsoft Fingerprint Reader
Log On with the Touch of a Finger

- Easy and convenient password replacement
- Replace passwords with fingerprint convenience*

* Microsoft Fingerprint Reader should not be used for protecting sensitive data like financial information or for accessing corporate networks.

NEW

Available November

$77

websearch: 249736

Microsoft Wireless Notebook Optical Mouse
Goes with You. Works with You

- Snap-in receiver
- Saves battery power by turning off automatically when snapped in
- Longer battery life
- Optical technology for precision accuracy and speed
- Designed for comfort for either hand
- Scroll Wheel to move through documents quickly

NEW

Available November

$69

websearch: 249753

Microsoft Standard Wireless Optical Mouse-Black
Value In a Wireless Mouse

- Long Battery Life - Many users average more than six months battery life
- 3 Button mouse
- Optical Technology for speed and precision accuracy
- Designed for comfort for either hand
- USB/PS2

NEW

$46

websearch: 248543

Microsoft Optical Mouse
Bring Your Desktop to Life

- Optical Technology
- Unique hemisphere design
- Glowing scroll wheel
- Comfort for either hand
- Offers durability, increased speed, accuracy and consistent performance
- Navigate documents & web pages effortlessly without using the on-screen scroll bar

NEW

$46

websearch: 248541

Microsoft Digital Media Pro Keyboard
Great Value In a Keyboard That Fits Your Digital Lifestyle

- NEW! Zoom Slider- Zoom in and out of photos and images you view on-screen quickly and easily
- Multimedia Center - Control your media activities with the touch of a button
- Customizable Hot Keys - Get one-touch access to the programs and files you use most
- "My Favorites" Keys - Access favourite web sites and files with the push of a button

NEW

$46

websearch: 248542

Microsoft Internet Keyboard Black
Affordable Quality with Easy Access to the Internet, E-mail, and More

- Customisable Hot Keys - One-touch access to the programs and files you use most
- Durable design
- Detachable palm rest & adjustable keyboard legs help users work in the right position

NEW

$22

websearch: 248540

Microsoft Optical Desktop Elite for Bluetooth
Superior Wireless Performance, Comfort and Style

- Connect up to seven devices equipped with bluetooth technology*
- Tilt Wheel technology for side-to-side scrolling on keyboard and mouse
- Optical mouse with six months battery life
- Multimedia Centre - Control your media activities with the touch of a button
- "My Favourites" keys - Access favourite web sites and files with the push of a button

* Up to seven devices that adhere to the Bluetooth SIG (special interest group) profiles can be connected at any one time.

NEW

$218

websearch: 248567

Microsoft Intellimouse Explorer for Bluetooth
Our Most Advanced Wireless Mouse Ever

- Bluetooth wireless connectivity
- Connect up to seven devices equipped with Bluetooth Technology*
- Longer battery life
- Tilt Wheel technology for side-to-side scrolling
- Five programmable buttons
- Requires Windows XP

* Up to seven devices that adhere to the Bluetooth SIG (special interest group) profiles can be connected at any one time.

NEW

Available October

$112

websearch: 248569

No Worries!

* $12 Deliver anywhere in Australia
* No surcharge for Visa & Master Card
* 1 year back to base warranty

Wireless Headset

UHF-958

- Suitable for Computer/Hi-Fi/TV with excellent sound quality
- Using RF Technology with 100M range
- Go through wall & ceiling
- Adjustable frequency to avoid noise cause by other device

$65.00

X's - Drive II

Go on holiday but the memory card is too small to take a lot of photos.

No Worries

- 6 in 1 USB2.0 Portable Storage
- Support SM, SD, MMC, MS PRO, CF, XD with adapter and Memory Stick
- Build-in Li-ion rechargeable battery
- USB2.0 high speed Data transfer up to 480mbps
- Stand-alone, one touch to back up your memory card without PCs

without 2.5" HDD **$165.00**
with 30GB 2.5" HDD build-in **$315.00**
(Imagine how many photos you can take)

X's - Drive Pro

Go on holiday but the memory card is too small to take a lot of photos.

No Worries

- 9 in 1 USB2.0 Portable Storage with MP3 Player
- Support SM, SD, MMC, MS PRO, CF, XD, Memory Stick
- MP3 Playback
- Build-in Li-ion rechargeable battery
- USB2.0 high speed Data transfer up to 480mbps
- LCD Displays working status (No Picture Preview)

without 2.5" HDD **$195.00**
with 30GB 2.5" HDD build-in **$345.00**

256MB MP3 Player

with Flash Disk

AU-EM305S

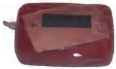
- Support MP3/WMA/Data **$159.00**
- Voice Recorder
- Build-in FM Tuner 187~108mHZ
- Over 12 hours battery life

MP3 Player

AU-EM107i

$55.00

- without internal memory
- Support SD/MMC
- Support MP3 format



MP3 Partner FM Transmiter

$49.00

This product allows you to transmit your favourite songs from your MP3 player to your car or home radio channel by matching the frequency of the transmiter & raido.

USB2.0 Pen Drive

Aluminium Alloy Body
Scratch Free

128MB **$59.00**
256MB **$79.00**
512MB **$149.00**
1GB **$325.00**

$59.00

USB Bluetooth Adapter

100M (Class 1)
AU-USBBT100

$59.00

2 Ports mini KVM Switch

GW-KS702

High Quality Multimedia Headset

with microphone perfect for Net meeting

$19.00

2.5" USB2.0 Portable HDD

Simple Backup Solution

Case Only **$29.00** 30GB **$175.00** 40GB **$195.00**
60GB **$249.00** 80GB **$385.00**

3.5" USB2.0 Portable HDD

Case Only **$59.00** 80GB **$165.00**
120GB **$225.00** 200GB **$299.00**

3.5" Combo Backup Hard Drive

(USB2.0 + Firewire Ports)

Case Only **$99.00** 80GB **$195.00**
120GB **$259.00** 200GB **$329.00**

No Worries! USB Technology

USB Technology

Ph: (02) 99871591 Fax: (02) 99871592 sales@usbtech.com.au

USB Technology P/L ABN 32 095 050 169 **8/22 Leighton Place, Hornsby NSW 2077**

All prices subject to change without notice. For current pricing contact us.

See all these products & more on our website...www.usbtech.com.au

Tsunami Dream

Designer Case by Thermaltake

VA3000SNA

VA3000BNA

Dual 12cm Cooling Fans

400w Power Supply Included

Slide-in Cage

Dual USB2.0, IEEE firewire 1394, Audio and Speaker Port

Lockable Side Panels

P/N	VA3000SWA, VA3000SNA, VA3000BWA, VA3000BNA
Drive Bays	11. External 4 x 5.25", 2 x 3.5". Internal 5 x 3.5"
Net Weight	6kg (13.2lb)
Motherboards	Micro ATX, Standard ATX & Extended ATX (Dual CPU)
Dimension	(H*W*D) 495 x 210x 478 mm
Cooling System (5 Fans)	Front (intake). 120x120x25 mm, 2000rpm, 21dBA. Rear (exhaust). Blue LED fan, 120x120x25 mm, 2000rpm, 21dBA. Side (intake). 90x90x25 mm, 1800rpm, 21dBA
Material	Chassis - 0.8 mm fully aluminium
Features	Mirror coating. Screw less slots for easy assembly. 7x 3.5" slide-in cage. Dual USB 2.0, IEEE 1394. Firewire, Audio & Speaker ports. 400w power supply included

VA3000SWA

VA3000BWA

Thermaltake
COOLIN' YOUR LIFE

Thermaltake Australia and New Zealand

Unit 1/49 Henderson Rd, Rowville VIC 3178

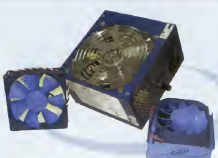
Phone: +613 9763 1622 Fax: +613 9763 1677

Website: www.thermaltake.com.au E-mail: sales@thermaltake.com.au

FSP GROUP

Would you trust a power supply vendor that has 250 R&D engineers working only on power supplies?

FSP-KIT350



Available in 350W

- Silent System Solution (3 in 1)
- Includes Power Supply, CPU Cooler & Case Fan
- Available for AMD K7, K8 and Intel P4 processors

FSP-400PFC

Available: 400W

- Super quiet
- Silent 12cm fan
- Intel ATX 12V compatible
- Complete output protection
- Meets international safety standards
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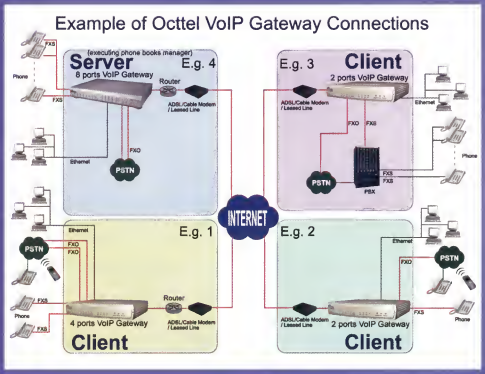

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DVD 16x **Diamond**	$49

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Leadtek FX5700 A360 128M	$225
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ATI Radeon **GeXcube** 9200SE 128M AGP	$83
ATI Radeon **GeXcube** 9600SE 128Mb	$129
ATI Radeon **GeXcube** 9600XTG 128Mb	$253
ATI Radeon **GeXcube** 9600XTVIVO 128M	$270
ATI Radeon **GeXcube** 9800XT 256Mb	$578

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Liteon 52x32x52 16xDVD Combo	$75
ASUS CDRW523252 52x32x52 IDE kit	$59
Benq 5232P 52x32x52 IDE kit	$55
Samsung SM-252FRNS 52x32x52	$55
Samsung SM352BRNS 52x32x52 16XDVD	$75
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- 40Gb 7200rpm HDD
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- 64mGeForce 4 MX
- 3D sound
- 16x DVD Rom
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- Subwoofer speakers
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- Microsoft Multimedia K/B
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- 40Gb 7200rpm HDD
- Panasonic FDD
- 64M GeForce 4 MX 440
- 3D sound
- 52x CD Rom
- 17" Flat monitor
- Subwoofer speakers
- Midi deluxe ATX case
- Benq Win98 keyboard
- Microsoft Intellimouse & pad

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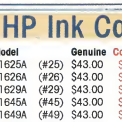
T003	$ 9.90	T018	$13.20	T039	$13.70	T0491/2/3	$ 8.90	S020187	$ 5.60
T005	$18.00	T019	$ 7.70	T0321	$15.10	T0494/5/6	$ 8.90	S020189	$ 6.50
T007	$10.80	T020	$11.20	T0322/3/4	$13.50	S020025	$11.20	S020191	$ 9.90
T008	$16.50	T026	$11.20	T0422C	$13.50	S020089	$ 9.90	S020193	$11.50
T009	$16.90	T027	$16.50	T0423M	$13.50	S020093	$ 5.60		
T013	$ 5.60	T028	$11.20	T0424Y	$13.50	S020097	$12.90		
T014	$ 9.90	T029	$13.75	T0461	$11.20	S020108	$ 6.50		

Canon Ink Cartridges



Model	Genuine	Compatible	Model	Genuine	Compatible
BX-3	$49.00	$24.00	BCI-3PC/3PM	$19.00	$6.40
BC-01	$39.00	--	BCI-6BK	$24.00	$6.40
BC-02	$39.00	$24.00	BCI-6C/M/Y	$24.00	$6.40
BC-03	$38.00	$24.00	BCI-6PC/6PM	$24.00	$6.40
BC-05	$50.00	$35.00	BCI-21BK	$13.00	$4.90
BC-20	$49.00	$28.00	BCI-21C	$28.00	$6.40
~~CLI-3eBK~~	~~$26.00~~	~~$ 6.50~~	~~BCI-24BK~~	~~$14.00~~	~~$6.60~~
BCI-3eC/M/Y	$19.00	$ 6.40	BCI-24C	$33.00	$7.20

HP Ink Cartridges

Model	Genuine	Compatible	Model	Genuine	Compatible
51625A (#25)	$43.00	$28.00	C6656AA (#56)	$32.00	$24.00
51626A (#26)	$43.00	$28.00	C6657AA (#57)	$47.00	$28.00
51629A (#29)	$43.00	$28.00	C6658AA (#58)	$37.00	--
51645A (#45)	$43.00	$26.00	C8727A (#27)	$31.00	--
51649A (#49)	$43.00	$26.00	C8728AA (#28)	$32.00	--
C1816A (#16)	$63.00	--			
C1823D (#23)	$47.00	$28.00			
C6578D (#78)	$48.00	$28.00			
~~C6614A (#20)~~	~~$42.00~~	~~$26.00~~			
C6615DA (#15)	$42.00	$26.00			
C6625A (#17)	$44.00	$28.00			

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Model	Genuine	Model	Genuine
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12A1980	$56.00	18L0042 (#83)	$53.00
13400HC	$53.00		
13619HC	$52.00		
17G0050	$46.00		
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HP C3906A	$105.00	$ 59.00	HP C4182X	$285.00	$165.00	Samsung ML-4500D3	$ 97.00
HP C3903A	$130.00	$ 75.00	HP C7115A	$ 99.00	$ 59.00	Samsung ML-5200D6	$163.00
~~HP C3900A~~	~~$249.00~~	~~$115.00~~	~~HP C7115X~~	~~$125.00~~	~~$ 85.00~~	~~Samsung ML-6060DE~~	~~$165.00~~
HP C4092A	$ 99.00	$ 59.00	HP C8061X	$195.00	$ 85.00	Samsung SCX-4216D3	$ 96.00
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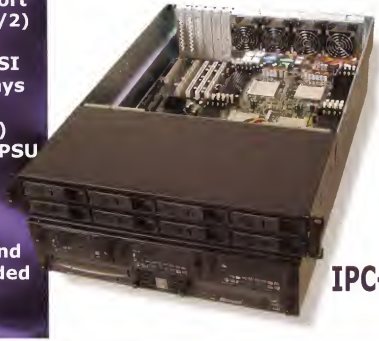

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Downtime

High-performance playtime

Couch potato

A plasma TV is the ultimate, but beyond the reach of most. *Dan Warne* reckons that a wide-screen LCD is the perfect compromise.

OFF THE HOOK

Samsung LS32A33W 76cm

Samsung's LCD TVs are just as good as its monitors. The high-definition picture quality is brilliant, with lightning fast 16ms pixel latency. The DVI connection allows you to connect your PC as well, making the $6,000 price tag easier to justify. Two tuners provide picture-in-picture capability (though they're only analog). Onboard Dolby Digital and DTS decoding gives you direct surround sound outputs without needing an AV amplifier, and the TV has three meaty built-in JBL 15W speakers and subwoofer output.

▲**Upsides:** DVI, dual-tuners, two-year warranty.

▼**Downsides:** no memory-card reader. No zero dead pixel guarantee.

Details

Online	www.samsung.com.au
Price	$5,999
Verdict	★★★★½

Sharp Aquos 66cm LC26GA3X

▲**Upsides:** 800:1 contrast ratio for rich blacks. Allows the capture of TV to MPEG-4 format using PCMCIA hard drive or an optional memory card reader. Three-year warranty.

▼**Downsides:** dead pixel warranty claims are done on a case-by-case basis. No DVI input. No surround sound decoding. Speakers are only 2.1W per channel (4.1W total).

Details

Online	www.sharp.net.au
Price	$5,499
Verdict	★★★½☆

Panasonic Viera 66cm wide-screen LCD TV TX26LX1A

▲**Upsides:** SD and PCMCIA memory card slot for display of pictures. Lots of inputs — four composite, three S-Video and one component. Snappy 16ms response time.

▼**Downsides:** the built-in speakers are only 10W each. No DVI input, no surround sound decoding, one-year warranty, 500:1 contrast could be better. Only one analog tuner.

Details

Online	www.panasonic.com.au
Price	$5,499
Verdict	★★★☆☆

Sony 66cm wide-screen LCD WEGA KLV26HG2

▲**Upsides:** Zero dead pixel warranty once registered.

▼**Downsides:** No built-in tuner. No DVI line input, so you can't connect your PC or HD box digitally. Only reads Sony's proprietary Memory Stick (standard and pro) formats for photo and MPEG playback. One-year warranty is worrying for a TV. Built-in speakers are a measly 4W each.

Details

Online	www.sony.com.au
Price	$5,299
Verdict	★★☆☆☆

Xwires

Wireless won't make you play better.

If your neck's locked up from swivelling your head across the big screen while gaming, getting away from the action is the answer with the Wideye-Microgram XC1 Wireless Xbox Controller.

It's somewhere between the original and S-type controllers in size, but the tail thumbstick may make it tricky for little fingers. Batteries last 50 hours, it can maintain control up to 10 metres from the screen and it has an inbuilt vibration feedback motor.

Xbox Live! hasn't been ignored either. An add-on XA1 audio communicator is currently on sale in the US, but is still awaiting approval for sale in Australia.

Details

Online	www.microgram.com.au
Price	$139
Verdict	★★★½☆

Grab hold and burn rubber

Opening a beer and settling in behind the wheel for some fast driving is the ultimate thrill. But only in the safety of your home, of course. *Nick Race* takes three rival steering wheels for a spin.

Thrustmaster Ferrari F1

▲**Upsides:** the mix of shiny red box, carbon fibre and aluminium wheel and chequer plate pedals make this as close as you'll get to a real Ferrari on your PC. The force feedback has more grunt than a pig farm.

▼**Downsides:** at $300, you gotta love your driving games. With all the unmarked buttons, it'd be easier driving the real thing.

Details

Online	http://au.thrustmaster.com
Price	$299
Verdict	★★★★☆

Thrustmaster Enzo Ferrari

▲**Upsides:** the force feedback will give you arm muscles that would make Popeye jealous.

▼**Downsides:** feels cheap due to the plethora of plastic, and the faux carbon fibre finish on the wheel won't impress anyone. You'll be chasing the pedals across the floor if you use it on carpet.

Details

Online	http://au.thrustmaster.com
Price	$179.95
Verdict	★★☆☆☆

Logitech MOMO Racing

▲**Upsides:** the rubber wheel is easy to grip — even in the most sweaty-palmed race. Well built, so a fit of road rage shouldn't see bits of plastic flying around the lounge room.

▼**Downsides:** it's noisy and the pedals are too close together, so playing in socks is a must. But do you really want to smell your mates' feet?

Details

Online	www.logitech.com
Price	$199.95
Verdict	★★★☆☆

Snoop doggy lock

If you've witnessed the consequences of workplace practical jokes involving someone using a co-worker's email address, the LASER Wireless PC Lock will provide peace of mind.

It's a USB key, wireless medallion and software combo which locks your computer if you move more than two metres away from it. Come back within range and it unlocks. If you leave the medallion at home you can unlock your PC with a password.

Details

Online	www.laserco.com.au
Price	$49.95
Verdict	★★★★☆

Cool your cockles

Computer makers adopted "notebooks" over "laptops" because high-spec models generate groin-grilling amounts of heat. *Dan Warne* checks out two lap savers.

Karabri Lap ramp

▲**Upsides:** simple and inexpensive, it's a piece of moulded plastic that lifts the computer away from your lap. Large cut-out areas ensure there's ventilation for both your laptop and legs. Rubber strips grip your notebook securely.

▼**Downsides:** passive cooling only. It would be better if it were collapsible for flat storage in a laptop bag.

Details

Online	www.lapramp.com.au
Price	$25
Verdict	★★★★☆

Cooler Master CoolPad

▲**Upsides:** two USB-powered fans keep your notebook way cooler than normal — in fact your lap may get a bit chilly from the constant airflow. Aluminium construction picks up heat from the notebook and conducts it away very effectively.

▼**Downsides:** saps notebook battery life. The small ridge at the front of the pad isn't large enough to stop a notebook from slipping off. Relatively expensive.

Details

Online	www.australiait.com.au
Price	$66
Verdict	★★★☆☆

Shooting spree

There are places — the bush, the beach, the Bronx — where you want to take photos but don't want to take a $2,000 digital camera. *Nick Race* looks at three high quality sub-$500 alternatives.

Canon PowerShot A75

▲**Upsides:** easy to use, and the results look great for a 3.2 megapixel camera. Plenty of vibrant colour; you'll think you're in the Bahamas!

▼**Downsides:** movie mode isn't crash hot, and you'll be lucky to get 90 seconds on the supplied 32MB CF card.

Details	
Online	www.canon.com.au
Price	$449
Verdict	★★★☆☆

Sony Cyber-shot DSC-P43

▲**Upsides:** it's small enough to lose in a pocket full of change. Clear pics and MPEG movies will delight friends and family on "slide night".

▼**Downsides:** images stored on Memory Stick. Degree in Cyber-shot operation required. Power button hard to find in a hurry for those "candid" snaps.

Details	
Online	www.sony.com.au
Price	$449
Verdict	★★★☆☆

Kodak EasyShare CX7530

▲**Upsides:** large, bright LCD screen for framing the right shot. Five megapixel CCD means huge resolution for blowing up on a printer. Slot it into the optional extra $299 Kodak Easy Share printer dock for terrific 10 x 15cm photo prints produced using dye-sublimation technology. Also charges in the dock.

▼**Downsides:** takes what seems like an age to store a picture once it's "clicked".

Details	
Online	www.kodak.com.au
Price	$499
Verdict	★★★★☆

More pixel for your pleasure

Mobile phones are moving out of the realm of blurry, VGA-quality pictures and into high resolution camera territory. *Peter Curtis* pits two against each other.

Sharp GX30

▲**Upsides:** extensive photo manipulation features (image rotation, framing and a range of filters). Digital zoom. Includes an 8MB Secure Digital memory card. Bluetooth compatible.

▼**Downsides:** weak quality shots. Resolution is not quite a megapixel (1,144 x 858). PC software only synchronises contacts with Outlook or Outlook Express. No calendar or task sync. Bluetooth doesn't work for PC sync; only connects to a PC via an optional USB cable. The multi-coloured disco flash effect is cool in theory, but can't be combined with MP3 playback.

Details	
Online	www.vodafone.com.au
Price	$899
Verdict	★★☆☆☆

Nokia 7610

▲**Upsides:** photo quality is surprisingly good, with slightly higher resolution (1,152 x 864) than the Sharp. Symbian OS provides basic functionality to adjust brightness, contrast and apply filters. Image Converter PC software converts images from a variety of formats, allowing you to zoom, flip, rotate, crop, emboss, motion blur, colourise and so on. Cropping feature offers presets such as portrait, MMS Picture and wallpaper. The supplied PC sync software is powerful and refined. Internal antenna.

▼**Downsides:** sluggish menu response. "Quirky" keypad design. Looks like something you'd buy in the canned fish section of the supermarket.

Details	
Online	www.nokia.com.au
Price	$999
Verdict	★★★★☆

Dorkslayer

Most Bluetooth headsets make you look half cyborg, half wanker. Not this one.

The Wideye BP100 Bluetooth Pendant Headset hangs around your neck, so you can conceal the electronics under your shirt. All anyone will see is a secret service-style headphone running to your ear. Of course, if you still want to "be seen" with your Bluetooth headset, you can hang around in lobbies saying things like "Eagle is on the move".

The Wideye worked a treat with our Sony Ericsson T610 test phone. But a word of warning: the rechargeable battery is difficult to insert and you've no hope of pairing it with your phone if you don't read the manual. And it ain't cheap — at $199, the old cyborg-style headsets may still appeal.

Details	
Online	www.microgram.com.au
Price	$199
Verdict	★★★☆☆

Pushing all your buttons

iPods as universal remote controls? It can be done, writes *Dan Warne*.

Glad it's wrapped

First-time owners learn the hard way that the iPod's polished metal back and shiny polycarbonate face scratch very easily. Even Apple's svelte nylon case scratches the iPod as it's slipped in and out. One simple but ingenious solution is a form-cut piece of clear, flexible acrylic which "wraps" the iPod and clings by static electricity. Your iPod's buttons continue to work through the wrap and your 'Pod will still fit into Apple's nylon case when wrapped up.

Details

Online	www.jrhilliandcompany.com
Price	US$8
Verdict	★★★☆☆

All-in-one iPDA

OFF THE HOOK

Every once in a while software appears that is just disgustingly good. iPod Agent is one such program, transferring Outlook mail, appointments, contacts, tasks and notes to your iPod. It also grabs weather forecasts, RSS news feeds, and can automatically download Australian movie times and puts them into your 'Pod.

Details

Online	www.ipodsoft.com/ipodagent.aspx
Price	Free
Verdict	★★★★½

iPods may be designed to do one thing and do it well, but gadget fans are working their lateral thinking lobes overtime to squeeze unimaginable functionality out of their 'Pods.

The popular gadget blog engadget (**http://engadget.com**) has discovered a trick whereby infra-red signals from remote controls can be "recorded" as sound and played back from the iPod as infra-red again. The idea is that you can record the signals produced by the buttons on your various remote controls and then control all your devices — TV, set-top box, stereo and so on — from your iPod. As long as you don't mind doing it all with the iPod's scroll-wheel, that is.

The engadget crew says it has a TV, DVD player, satellite TV receiver, hard drive TV recorder, media centre PC, Xbox, satellite radio tuner and even a robot under the control of the iPod. Using an ingenious bi-directional sound-to-infra-red converter from Griffin that looks something like a satellite phone antenna, the "Total Remote" hack was originally designed to allow its owners to use PDAs as universal remote controls.

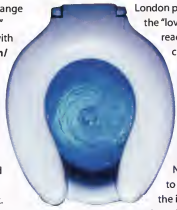
The tricky part is getting the infra-red signals recorded as sound in the first place. You need to get your hands on a Windows Mobile-based PDA, plug in the Total Remote and record the infra-red signals from your regular remote into the PDA. These sound files are then recorded to a PC, and from there to the iPod via iTunes. The infra-red "sound recordings", which can be set up in a playlist for easy access, are stored as individual music tracks on the iPod. When played, the Total Remote converts them back to an infra-red signal Griffin claims is "way stronger" than a normal remote and can control a device up to 30m away.

We can't help wondering how long will it be before "remote control sound recordings for 22in Sony WEGA KV-36FV27" start popping up on SuprNova (**http://suprnova.org**).

The Griffin Total Remote can be purchased from eXpansys (**www.expansys.com.au**) for $62.95 or ordered directly from US-based Web sites for as little as US$13. Go to **www.apcmag.com/info/iPodremote** for a full tutorial.

Pundits are tipping that Griffin will now release a version of Total Remote specifically for the iPod. It had planned the release of such a device under the moniker PodMate, but development was cancelled before it was brought to market.

Flush with success



Aficionados have developed a range of "choose your own adventure" storybooks that run on iPods, with a Web site (**www.ipodsoft.com/Downloads.aspx**) dedicated to the resurgence of the '80s phenomenon. Here, nestled between the explicit content stories, are a disproportionately high number of tales revolving around iPods being confiscated by teachers and their owners' valiant efforts to get them back.

If reliving your school days isn't at the top of your recreational priorities, there are other interesting downloads available. For example, the pPod project (**www.nykris.com/template.php?id=64**) includes reviews of 114 London public toilets to help you find the "loveliest" facility. While you're reading up on the best bogs, you can listen to the accompanying soundtrack, "Music to P by", which includes *Cosmic Winds* and Handel's *Water Music*.

Both the choose your own adventure stories and pPod make use of third and fourth generation iPod's little utilised Notes facility, which can be used to transfer text from a PC or Mac to the iPod. These are simply stripped-down HTML files which include hyperlinks to other documents and music.

Obviously the possibilities don't end there, and within a few months we expect iPod users to be flush with guides to all sorts of things.

XSONIC

X-Infinity
RRP$169

Xsonic XTablet

Imagine a computer that you can use as a note pad to draw on and carry around. Accomplish your everyday word processing requirements with writing recognition as well as taking pictures and recording major presentation at the same time.

Xsonic XTablet that features a 20GB hard drive (upgradable) , 2 x USB ports, an onboard network card, a 4-in-1 card reader, a digital pen and a build-in digital camera would be a simple yet economical way to organise your task on the fly

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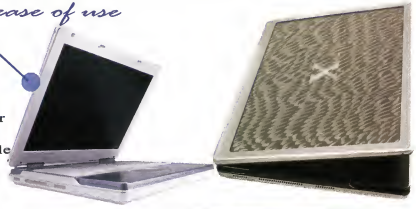

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* All pictures are for illustration only. Accessories are optional.

Mercury ASUS VOLCANO PAULT LITEON Thermaltake BELKIN COMEP Enhanced Archive UNITEC

Desperate: Spidey went to extreme measures to film the Paris Hilton tape.

Riot prevention: racing the crowds to get a bargain at Saks Fifth Avenue.

Ultimatum: "Buy the game and I'll set you free".

Spider-Man 2

FLOATER

Technology won when Tobey Maguire was out-acted by a CG animation in *Spider-Man 2*. The PC game is a different story.

Doc Ock is an overweight scientist with a lukewarm attitude and four metal tentacles sprouting out of his back. As the evil genius in the game version of Spider-Man 2, he has all the menace of your dad after a few too many beers on Christmas Day. Most resilient gamers can get past flaws like this if the story is up to snuff. Unfortunately, this time it's not, which goes to show that employing more French horn players in the orchestra (the credits list six) than writers for the game (four) is not a great idea.

The lack of a story is the least of this game's woes. Stop and think of Spider-Man's biggest asset. It's mobility, the way he zips around with all the finesse of Rene Rivkin's legal team. But guess what? As Spidey, you can only fling out webs to a limited selection of target spots, making your progress very predictable and scripted. In a world of games emphasising freedom and range of motion, it seems so '90s to only be able to throw out the sticky stuff at rigidly prescribed points. It's obviously not a technical problem — the far superior console versions of this game manage the feat with ease — it's just lazy.

The opening stages of the game demonstrate the developer's unwillingness to think outside the box. You're meant to be chasing a van, but a car crash blocks a tunnel. There's ample room to jump across the bonnets of the smashed cars, or to climb up the tunnel's arch and crawl on its ceiling through the copious space above the vehicles. Try it and while Spidey goes through his movement animations, he can't move or propel himself forward. Great if you're fond of Marcel Marceau impersonations, not so great if you've been spoiled by open-plan games like Grand Theft Auto, or indeed any of the flood of titles designed to encourage human ingenuity.

It's a sad statement when the highlight of any game is the training mode, and that's purely because of the narrator — Bruce (*Evil Dead*) Campbell. This man could probably read the telephone directory aloud and make it sound interesting — unlike Tobey Maguire, who sounds as if he's employed the members of Cypress Hill as vocal coaches. But who wants to spend close to $100 on a game purely for vocal entertainment?

And making a gameplay this basic while at the same time slapping enough adult content in it to justify an M rating just doesn't make sense. If Spider-Man had been more kiddie-oriented at least less-discerning youngsters who don't mind being bombarded with merchandising ads might have been able to play it. Our tip: develop a case of arachnophobia. Or, if you have the means, spring for the superior console versions.

The Lowdown

▲Upsides: Bruce Campbell's voice; it doesn't crash when you play.

▼Downsides: everything else; it doesn't crash when you play.

Details

Contact	Activision
Online	www.activision.com/microsite/spider-man
Price	$89.95
Verdict	★½☆☆☆

Joint Operations: Typhoon Rising

One server. A handful of vehicles. 150 first person shooter players. Mayhem? Guaranteed.

Joint Operations: Typhoon Rising is undoubtedly a great programming effort. Any game that can boast 150 players on a server at the same time has to have decent network coding chops and server testing ability. Whether the upstream capacity available to Australian broadband users is up to the task of taking in what over a hundred other people are doing is not so easily discerned. If you're in the market for a 1,500/256 broadband plan — or basically anything faster than the current bog standard 128Kbit/s upstream — then you're going to find this game a lot more playable.

Wrong turn: *the Johnsons come to regret buying budget chorts for their honeymoon cruise.*

Joint Operations: Typhoon Rising is a multiple class, team-based first person shooter set in modern times. Mind you, you have more chance of finding weapons of mass destruction than of getting large numbers of people online to work as part of a team. The only consolation is that the opposing team faces the same handicap.

The game's graphics engine is decent, with slight concessions made to cater to large playing maps and the sheer number of people onscreen. It's a lot better than your average EverQuest-style RPG, that's for sure, even though a similar number of players is ambling about.

You get plenty of vehicles to navigate over the game's 50-plus square kilometre maps, but this is one area where shortcuts have been taken. Controlling these lumbering devices feels very artificial and doesn't have the same weighty, fine control as games like Unreal Tournament 2004 or the Battlefield series.

Taking into account Joint Operations' lack of a single play mode — except for a fair to middling tutorial — it might be wise to wait and see if the masses flock in before you do the same.

Off the island: *Survivor gets nosty come voting time.*

The Lowdown

▲Upsides: 150 players on a server is nothing to sneeze at.
▼Downsides: lack of single player mode options; poor vehicle handling.

Details

Contact	Electronic Arts
Online	www.jointopsthegame.com
Price	$69.95
Verdict	★★★½☆

Soldiers: Heroes of World War II

What the world needs now isn't love, it's World War III. Anything to stem the WWII game tide.

Software companies must be almost done with World War II by now — surely there's no stone left unturned throughout the Eastern Front or North Africa. To its credit, Soldiers: Heroes of World War II is a tasty little number from Codemasters that is actually worth donning your favourite *Saving Private Ryan* PJs for — no mean feat given the plethora of similar games out there.

It's portrayed in the familiar RTS style but, as in Europe, it's the little differences that you notice: a subtly impressive 3D graphics engine — both co-op and adversarial multiplayer modes, over 100 vehicles, loads of weapons and more than 25 single player missions. And that's just the start.

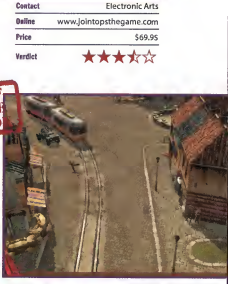
Fixer-upper: *improve property value by bombing the neighbours into oblivion.*

The ability to control your units with a greater deal of precision than most RTSes makes this more accessible and friendly to the average fan. Subtleties, such as the need to maintain supply lines and the ability to ransack enemy resources, are well-managed and logical, rewarding forward thinkers more than furious clickers.

Some omissions that hurt the experience include the lack of warning when your units that are offscreen are under attack. A bit more notice might be handy, instead of finding the CPU has reduced your fire team at another location to a strawberry stain. Also, pathing AI is once again a bugbear. However, Codemasters isn't alone in wrestling with this problem — most RTS games seem to be hitting trouble when it comes to giving units some autonomy.

Like Ground Control II, Soldiers isn't the next big pro gaming RTS platform, but it's the kind of game that all too often gets ignored in favour of that next big thing. Such a fun, polished gaming experience deserves a much better fate.

OFF THE HOOK



Transit nightmare: *where the streets hove no troins.*

The Lowdown

▲Upsides: great graphics engine; excellent single and multi-player modes.
▼Downsides: lack of alerts when offscreen skirmishes take place; pathfinding.

Details

Contact	Atari Australia
Online	www.atari.com.au
Price	$89.95
Verdict	★★★★½

Top 5 modern gaming icons

They may not have all been groundbreaking genre busters, but each of these titles has helped push PC gaming away from the fringe and into the spotlight.

5 COUNTER-STRIKE

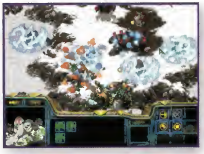
Angsty fans of Sierra's Half-Life may point out that Counter-Strike was initially a freely downloadable add-on for their game. But perhaps this terrorist versus counter-terrorist mod is responsible for selling more copies of Half-Life than the game itself. Hindsight makes it easy to understand why. Prior to CS, first person shooter games were all about twitch and aim, with tactics normally taking a distant second place. By dumbing down the gameplay, removing the emphasis on fast reflexes and rewarding methodical, cautious play, CS tapped into a vast pool of gamers previously daunted by the high-skill offerings. Like the nerdy kid at school who goes on to head a billion-dollar company, CS players have had the last laugh; the game has transformed itself into a pro platform attracting major sponsorship dollars, and is still the most popular FPS online.

4 DIABLO

Blizzard Studios is the only developer with two titles in this top five, and that's testament to the power of simplicity and focusing on gameplay above all else. Which is not to say that Diablo (and Diablo II) aren't works of art — they definitely are. While role playing purists are aghast when a game is more likely to test your mouse button than your knowledge of the Dungeons and Dragons ruleset, there's no denying that any game that consistently has over 100,000 people playing it at any one time is doing something right. Like EverQuest, the persistent nature of the Diablo world means advanced players often auction off certain items found in-game to desperate newbies via eBay. Unlike EverQuest, Diablo and Diablo II have a set storyline and series of challenges that players take on, either in small groups or solo, and there's no subscription fee.

3 STARCRAFT

Yes, Warcraft III looks better, and the Age of Empires series has more solo appeal, but there's only one real time strategy game that has captivated gamers to such an extent it became a pro gaming platform. And that is the venerable StarCraft. It's simple enough to get into, but the number of sub-strategies and variations possible make Blizzard Studios' offering the perfect game for its time. The North Koreans may have their eccentric "dear leader", Kim Jong-Il, but South Korea can boast StarCraft as its secret weapon. South Koreans rate as the best players in the world, and top exponents there are stars in their own right, with TV shows, endorsements and book deals. And before you laugh at how desperate the Koreans are for celebrities, just remember which country took Craig McLachlan & Check 1-2 to the second-top spot on its pop charts.



2 EVERQUEST

Sony flew in the face of convention when it released this game. Hard-core gamers prophesied immediate, humiliating failure — who would actually pay full price for a game and then have to pay a monthly subscription fee to play? It doesn't even have any solo game play! EverQuest remains a true love-it-or-hate-it experience. Detractors can't understand why people are willing to endure performing repetitive, mundane actions in order to slowly build up their online persona. Addicts will retort that the longer you play, the more you get out of the game. But the big drawcard isn't so much the barebones world that has been created, but the population — other players. As much a social exercise as a gaming one, players form alliances, enmities and their own history in-game. And the open-ended nature of play means the game is never over. That is, until the release of EverQuest II, due this year. Start saving.

1 GRAND THEFT AUTO III

Unlike every other game on this list, this title is only multiplayer if you hack up a basic multiplayer mode for it yourself. Unlike 99% of games released — again including the others on this list — GTA III has a storyline and level of characterisation that would pass muster in a decent film. And unlike any other game released to date (barring its sequel, GTA: Vice City) this game has brought about the rebirth of computer cool, last seen taking a battering with *The Matrix* sequels. Everyone jumped on the bandwagon and it's still rolling for Rockstar Games, the now legendary makers of this third person criminal simulator. Freedom is the key. Do what you like in the big city, seamlessly blended into a natural progression of quests that actually make sense. The competition may have spent big dollars attempting to emulate the style, but our advice is this — don't bother.

men's style
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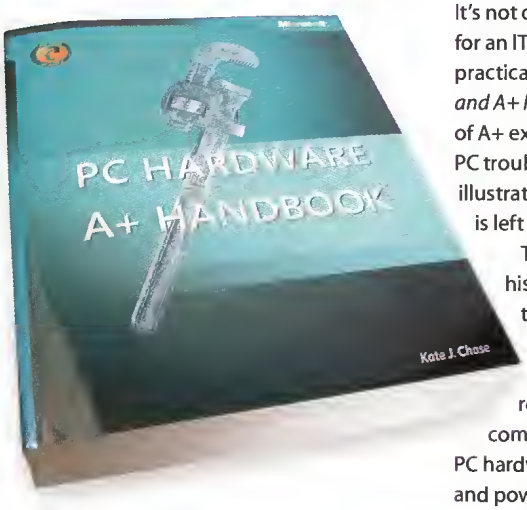
THE MEN'S MAGAZINE
FOR THE MAN WHO WANTS IT ALL

ON SALE NOW

PC Hardware and A+ Handbook



It's not often that a book designed to prepare you for an IT certification exam can also double as a practical sourcebook. However, the *PC Hardware and A+ Handbook* delivers the rare combination of A+ examination essentials plus step by step PC troubleshooting and workshops. Heavily illustrated with photos and screenshots, little is left to the imagination.

The book starts with a bare bones history of computing and the rise of the IBM compatible, including good information on the toxicity of PC components and proper disposal and recycling procedures. This is followed by a comprehensive guide to the nuts and bolts of PC hardware — motherboards, CPUs, RAM, cases and power supplies.

Rather than taking the dry approach common to rote learning certification manuals, these sections include bonuses such as shopping tips and plain English explanations of mysteries like the workings of drivers and the elusive frontside bus. Although technology-specific hardware is addressed in the examples, the text includes enough groundwork to prepare you for future advances in CPU types, sockets and the like.

With the essentials covered, the book moves on to explore add-on hardware, with individual sections dedicated to modems, video, audio, network cards, hard drives, removable media, monitors, printers and wireless devices. An additional chapter is dedicated to input devices such as mice, keyboards, scanners and game controllers. These are all delivered in a concise manner, with useful shopping hints and exam tips given along the way. The concluding chapters on notebooks and DIY computer building are good but hardly comprehensive. Although simplified, they nonetheless provide a basic introduction to the subject.

Overall, this title succeeds superbly as both a reference book to PC hardware as well as a study guide for the A+ exam. Because it tries to tackle so much it can lack a little detail and skim over those really hard to fix problems, but it only has to help you resolve one issue (or pass one exam) to pay for itself.

Daniel Winter

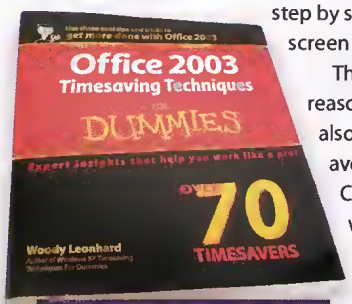
Details

Publisher	Microsoft Press
ISBN	0735620490
Price	$79.95

Office 2003
Timesaving Techniques for Dummies

Office 2003 Timesaving Techniques for Dummies provides. . . well, 72 ways to save Office users' time. These aren't simple tips such as keyboard shortcuts, they are efficient methods for carrying out real work tasks. Most of the points are also applicable to Office XP, so don't discount this book just because you haven't upgraded yet. As a bonus, experienced users of Office X and 2004 for Macintosh can easily adapt some of the techniques.

The early chapters are mainly about changing default Office settings to others that work better, and it demonstrates an easy way of transferring Office settings from one computer to another. A few of the tips delve into the use of macros, but the information is presented in a way that most Office users should be able to follow. Indeed, the entire book combines clear descriptions of scenarios, step by step instructions and well-chosen screen grabs.



This title's primary target audience is reasonably experienced users, but it could also be useful for neophytes who want to avoid getting into inefficient habits. Coverage of the various applications is well balanced. Those spending 90% of their Office time in a particular app, such as Excel, should look for a book specifically about that program. The rest will be happy with the variety and cross-application techniques presented here.

Stephen Withers

Details

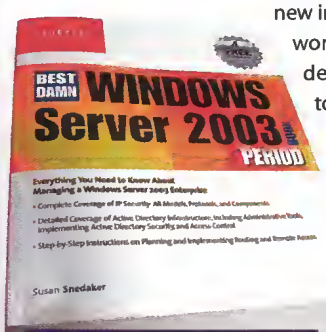
Publisher	John Wiley & Sons
ISBN	0764567616
Price	$44.95

Best Damn Windows Server 2003 Book Period

Although this book's title is short on modesty, it tackles substantial topics including high-availability strategies, routing and remote access, troubleshooting disk and volumes, monitoring secure network activity, and the various facets of Active Directory.

Much can be written on Windows Server 2003; indeed, Microsoft suggests that Windows Server 2003 is so feature-rich that any individual "service" in this OS has more functionality than all of Windows NT 4. In this regard, the author has done a tremendous job of producing such an accessible and concise work.

Thankfully, this book doesn't begin with trite questions like "What is Windows?" or discussions of basic subnet addressing. Instead it commences with an enthusiastic overview of what's new in Windows Server 2003 and then works solidly through each of these developments. Every necessary topic to set up and run an efficient and secure server is covered.



Not that it's perfect. There's nothing on BAT files, scripting or replicating Active Directory across a firewall. That said, resources on command files are plentiful and such advanced topics are relevant only to a few. This book is recommended to all Windows Server 2003 administrators.

David Williams

Details

Publisher	Syngress
ISBN	1931836124
Price	$110

How to Do Everything with Photoshop CS

How to Do Everything with Photoshop CS is aimed at amateur photographers who want to significantly improve original images with their PCs, and it provides a useful introduction to Photoshop's basic capabilities.

Opening with the standard chapters on the Photoshop interface and toolbars, the book then moves onto working with layers and manipulating text. Each concept or procedure is clearly explained and accompanied by sample photographs and screenshots.

Though the range of material covered is sufficient for most, there is one unfortunate omission. The RAW format is commonly utilised to download photographs from a digital camera, but this guide neglects to explain how such images can be imported and manipulated in Photoshop.

Despite that oversight, this book provides a comprehensive introduction to the Photoshop environment.

Alan Crawford

Details

Publisher	Osborne/McGraw Hill
ISBN	0072231432
Price	$44.95

Keep Your Kids Safe on the Internet

Promising to help the parents of young children safeguard against "paedophiles, cyber-stalkers, viruses, hackers and spyware", this book delves straight into the most serious of subjects, such as "Paedophiles are Using the Internet to Look for Kids". Though it appears sensationalist, the author supports his assertion with a number of statistics designed to impress upon parents the importance of this issue.

The remainder of the text is then dedicated to reviewing and testing the various software packages available to improve Internet safety. Filtering software presents the most obvious and practical choice, with several options examined in detail. Alternative means of enhancing security are also tested and discussed, including firewalls, antivirus apps and malicious software detectors.

Keep Your Kids Safe on the Internet presents a useful overview of the options available for improving the online safety of children.

Alan Crawford

Details

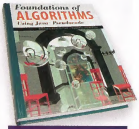
Publisher	Osborne/McGraw Hill
ISBN	0072257415
Price	$34.95

Foundations of Algorithms

Using Java Pseudocode

Algorithms are the foundation of computer science and are important for any programmer who wants to produce efficient and reliable code. By evil necessity, any discussion of algorithms must include a lot of mathematics. Happily, this title excels because the maths is greatly simplified and the authors use clear English and simple notation.

As the title suggests, the algorithms developed throughout the text are presented in a Java-like language that focuses on the mechanics of the algorithm and excludes all the necessary Java housekeeping. But it's close enough for any competent Java programmer to transform an algorithm into working code, even if they don't work through all the maths.



The book covers a broad range of algorithms, grouped according to function, including Huffman coding.

David Williams

Details

Publisher	Jones and Bartlett
ISBN	0763721298
Price	$89

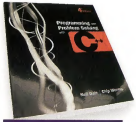
Programming and Problem Solving

with C++, 4th edition

Essentially an undergraduate textbook for university computer science courses, this title provides a clear introduction to C++, object-oriented programming and software development.

A large section of the book is devoted to the basic premises of programming in general. It then progresses onto C++, moving from the fundamentals onto abstract data types, templates, inheritance, encapsulation and object-oriented design.

ISO/ANSI standard C++ is used throughout the book, making it current and precise but also version-neutral, with no reference to the use or idiosyncracies of any specific implementation. A possible weakness however, is that the book offers no coverage of GUI programming and all input/output is via the console.



That aside, the authors meticulously detail the way the C++ standard has evolved and provide an appendix to help migrate niggling code problems from one standard to another.

David Williams

Details

Publisher	Jones and Bartlett
ISBN	0763707988
Price	$95

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mmmm, DATA

Bovine storage

Cows are known for their freaky four stomach configuration to store and process digested food. So maybe it's not too ridiculous to think that cows = storage.

Startup companies are now playing with cow guts to make replacement hard drives, flash memory and other storage devices. Outfits such as UK-based NanoMagnetics are mixing molten silicon, synthetic molecules and cow protein globules in the hope of cutting manufacturing costs for storage makers.

CNET reports that the firm has "developed methods for inserting a magnetised particle inside a sphere of ferritin, a protein produced by animals. Assembled in arrays, the magnetised protein globs can be flipped to represent 1s and 0s, the basic units of digital information."

Animal rights activists are expected to start urging people to "please think of the cows".

Blockbuster conferences

Okay, some conferences are best described as only for the truly dedicated — Storage World being a case in point.

But we've recently noticed a new trend in marketing tech conferences. Borrowing from '50s B-grade cinema, Email Management World (no lie!) depicts a man being crushed by a giant @ symbol that clearly threatens to oppress humankind. Even his purple suit is no protection against this menace.

Send us the top 10 blockbuster conferences coming soon to a hall near you. *chipchat@apcmag.com.*

Ermmmm...

European tech magazines do things differently. First there are the attractive women on the covers. The thinking from publishing executives goes like this: "Hey, it's mostly blokes who buy tech mags, and, like, most blokes dig chicks, right, and sex sells, right, so why not put babes on the cover? 'Cause that'll make people buy the mag, right? Technology is hot, hot women. Geddit?"

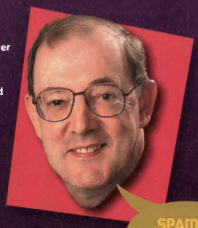
Until now, though, the women have mostly been standing there looking vaguely uncomfortable. Not any more. This cover suggests things have taken a turn for the slightly surreal. Yes, this woman is licking a graphics card. Not even Nostradamus saw that coming.

This mag has a name, but really it needs a new one. Send your suggestions to *chipchat@apcmag.com.*

Pity the fool

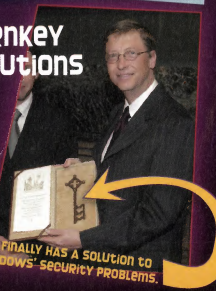
After a long day of Danish tarts, scones, and a parade of ivory tower thinkers at a recent International Telecommunications Union (ITU) meeting, Dr Robert Horton found himself rubber stamping an ambitious plan. Gripped by hyperbole and the warrior vernacular of our time, he got so revved up that he ripped with: "I am convinced that we can curb spam within the next two years if we act on a number of fronts simultaneously..."

Two years eh, Bob? Mind you, he's in a top position to make things happen. Besides being chairman of the ITU committee on countering spam, Bob's day job is deputy chair of the Australian Communications Authority. We eagerly await ACA action meeting its rhetoric.



SPAM IS BAD, MMKAY

Turnkey solutions



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A

The end of the ordinary snapshot.

Canon's PowerShot Pro1 is the first compact digital still camera with a professional standard lens. Evolved from a 60 year heritage of lens making, the Canon L-Series lens has a 7x optical zoom which is equivalent to 28-200mm in 35mm format. It is also fluorite equipped to ensure sharp, distortion free images and the Ultrasonic Motor gives you the advantage of quick and quiet zooming. The Pro1 combines an 8 megapixel CCD and a Canon DiG!C imaging processor ensuring your photos will be anything but ordinary. **canon.com.au/digitalimage 1800 021 167**

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